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ART. LV.—REPORT OF THE COMMITTEE OF REVISION, ON
THE NEW PHARMACOPÆIA, MADE TO THE COLLEGE,
AT A SPECIAL MEETING, NOV. 6th, 1841.

To the President and Members of the Philadelphia College of Pharmacy.

GENTLEMEN:—“The Committee of Revision,” appointed on the 30th day of March, last, to whom was assigned the duty of examining and amending the U. S. Pharmacopœia, having now reached a position in which they find themselves prepared to submit their labors to the College, and to retire from the highly responsible and important trust with which they have been honored, respectfully proffer a full and accurate account of their proceedings, together with a general statement of the result of their examination and revision in the annexed

R E P O R T .

The character and extent of the duties which have occupied the Committee for a period of nearly eight months, are such that a minute detail of them to the College, and a review of them by it, cannot possibly be expected, much less accomplished; and it will, therefore, be necessary that such a confidence shall be reposed in the Committee by the College, as will allow it to sanction or adopt the revised edition which the Committee here present, without the close scrutiny and inspection which, under other circumstances, could scarcely be dispensed with.

While asking such an unlimited trust in the faithful and correct discharge of their duties, the Committee hope to be enabled to establish their claim thereto by the exhibition of the general principles by which their proceedings have been governed, as well as the particular mode in which the revision and amendment has been conducted. In addition to the insight which such a narrative may give into the merits of the work which they have prepared, the Committee have the high satisfaction of exhibiting, in the actual result of formulæ, such evidence of their value as can with truth be said to be irrefutable. In the collection of specimens now before you, the Committee believe such evidence to exist, and they cheerfully rely upon the testimony of these mute witnesses to establish the claim which they prefer, for the confidence and reliance of their constituents, in other portions of their work not equally susceptible of demonstration. With this intimation the Committee will require the continued confidence of the College in the faithful execution of their trust, of which they consider their appointment an earnest. The Committee proceed to expose as much in detail as would prove useful and interesting, their action, and its results.

The proceedings of the Committee are recorded in two distinct journals, a division rendered necessary, by the entirely different character of the matter to be enrolled. These records are entitled, respectively, "The Journal of Amendments," and "Minutes of the proceedings of the Committee of Revision." The former containing purely professional matter ; the latter a record designed to present a history of the organisation and action of the Committee. The Journal of Amendments in a systematic arrangement, details all the amendments of which the Committee recommend the adoption, together with the reasons which urged their proposal, and is therefore that portion of the work of the Committee which is to be subjected to the judgment of the Committee of the *National Convention*. The minutes of proceeding afford a faithful history of all that has occurred in the Committee since its appointment. A perusal of the two records will place within the knowledge of any one cu-

rious or interested in the subject, an exact history of the revision of 1840 ; and should a reference ever be made to the proceedings of the Committee by whom the revision was undertaken, either as a beacon to be shunned, or an example to be imitated, to these volumes reference may be made with perfect confidence in the accuracy and fidelity of the register. Could time now be afforded to bring before the notice of each member, every amendment, with its annexed comment, your Committee might refer simply to their journals for an account of their labors, and the College be spared the extended report with which the Committee is compelled to occupy your time ; but as such a notice and examination is utterly impracticable by the College in its collective capacity, your Committee will endeavor, as briefly as possible, to present such an analysis and comment as will convey an idea of the character and extent of the revision which they have made ; and as they trust will enable you, without hesitation, to extend to it the protection, and sanction your adoption of it as your own.

By the resolution under which the Committee received their appointment they are directed and required to take the entire charge of the work ; to appoint a secretary, to subdivide into sections of such size as shall contribute most advantageously to a division of the labor, to fill vacancies which might occur in their body, to invite the co-operation of members and graduates of the College, to hold stated meetings at least once in two weeks, to keep a journal of proceedings, to arrange and compile the general results so as to produce a systematic work, to assign, as briefly as possible, the reasons for any changes which they might make, so that their propriety might be determined, to prosecute the work as rapidly as was consistent with due care and its proper execution, and to present to the College their work, as soon as finished, in a general report. Bound by these conditions, and guided by these directions, the Committee was directed to subject the Pharmacopœia to a complete revision, and generally, by removals, additions and amendments, by observation, experiment and

research, to bring the work up to the improved state of modern pharmacy, and to render it a type of the existing condition of the profession in this country. How well the Committee have understood the character of the duty thus imposed, and how faithfully they have respected and regarded the requisitions, must be determined by their report which follows, by the specimens upon your table, and by their journal and all their original documents herewith submitted, vouchers that their narrative is an uncolored, undisguised and impartial recital.

The first step which followed the announcement of their appointment, one or two days after the passage of the resolution of March 30th, was the organization of the Committee, which took place at a meeting held at the Hall of the College on the 7th of April, when every member, except one, who was prevented by indisposition, appeared, and undertook the duty to which he had been called. At this meeting, it was determined that it would be inexpedient to select a secretary from among their own number; and, as authorised, the Committee looked abroad among their associates and the graduates of our school, for aid in this department of their organization. They needed, for this service, one who, thoroughly acquainted with pharmacy and its kindred sciences, possessed, also, the enthusiasm, industry, and method, indispensable for the punctual and accurate discharge of the duty, laborious and extended as it promised to be; and such requisites they found subsequently to be possessed in an eminent degree by Mr. Wm. Procter, jr., to whom, by an unanimous call of the Committee, was assigned the place of secretary and collaborator. The Committee cannot withhold the expression of their warmest commendation for the manner in which the secretary has accomplished the object of his appointment; nor can they refrain from self-gratulation at having realized all the expectations which they had formed of the advantages which his acceptance of the trust would give. Thus much in justice to that officer, who, in addition to the arduous duties thus imposed, performed a prominent and most efficient part in the revision.

The further measures adopted, were to fix the periods for the stated meetings, to direct the preparation and publication of an address to the members and graduates of the College, inviting their co-operation, to direct the purchase of the necessary books and stationary, and to determine the subject for consideration at the ensuing meeting, which was fixed for the 21st inst. The measures thus proposed were all duly fulfilled; the stated meetings were fixed for every second Tuesday from the 7th of April. The address or invitation was prepared, published in the American Journal of Pharmacy, and distributed in the form of a circular especially addressed to every member and graduate, for the character of which see accompanying copy. The stationary and books were obtained; and at the ensuing meeting was commenced the actual revision of the Pharmacopœia, by entering upon an examination of the primary and secondary lists of the Materia Medica, and the table of weights and measures. It was now found to be expedient that more frequent meetings should be held than the College had directed, and accordingly, by adjournments, weekly sessions of the Committee took place, and continued from the 21st of April until the heat and increased demands upon the members for their professional labors, incident to that season, compelled the Committee, on the 30th of June, to adjourn until the 14th of July, and finally on that day to adjourn until the 25th of August, since which period the meetings have been regularly and punctually held on every second Tuesday.

The examinations and consequent discussions incident to a careful and thorough revision of the Materia Medica, occupied the Committee during seven of their sessions, independent of the attention and reflection, which, during the interval, engaged them individually. The number of the Committee was increased, by the election, on the 21st of April, of Ambrose Smith and Augustine H. Duhamel, as collaborators. In the choice of these gentlemen, the Committee again found reason for congratulation in the active, zealous, and persevering attention, with which their co-operation was characterized. Many original suggestions

and valuable amendments have been derived from the three additional members, who had by this time been associated with the Committee.

As premised at the commencement of this report, it is impossible to designate here a tithe of the alterations, additions, and amendments, which the Committee have deemed it their duty to make; nor if here specified, could the College, without a repetition of the labor, undertake to determine their value. It may, however, suffice to say, that the Committee have thought proper to recommend the condensation of the primary and secondary lists of the *Materia Medica* into one, which is to be called "The *Materia Medica*," and is to contain all the substances which were regarded as officinal, and therefore required to be kept by the apothecary, either to be employed in their native state, slightly modified by pharmaceutic manipulations, or required in the execution of some formula, in the subsequent division of the *Pharmacopœia*, devoted to preparations. The place of the secondary lists is occupied by a list of indigenous and naturalized plants, employed in particular localities of the United States. This class of remedies appears to require some official notice, and yet their properties are not considered sufficiently established, nor is their use sufficiently general, to entitle them to an officinal rank. The Committee have also introduced a change in the mode of arrangement of these two lists which is considered a decided improvement. The change is, to place the Latin phrases, expressing the officinal name and portion employed, in one column on the left side of the page, while the translation of each into its English correlative is placed in an opposite column on the right side; with an intermediate column containing the systematic name. Thus, instead of

Hyoscyamus,

Hyoscyamus niger, W. 1.1010

Henbane,

BW 1.161.

Folia, the leaves,

We shall have :

Hyoscyamus,

Henbane,

Hyoscyamus niger,

Folia,

The leaves.

The reasons which have induced this change are set forth in their Journal of Amendments, and it is hoped will be found sufficiently cogent to induce a concurrence in their views by the Committee of the National Convention. The Committee also adopted, as a general principle, the removal of all substances to the *Materia Medica* list from the preparations which are usually made by the manufacturing chemist and not by the apothecary. Among substances thus removed are all the essential oils, most of which are imported from foreign countries, none of which owe their preparation to the apothecary. In determining the botanical nomenclature of all plants placed on the official list, the Committee have adopted as a standard authority the *Prodromus* of De Candolle, and have excluded the references now existing in the *Pharmacopœia*, many of which were found to be incorrectly ascribed, and all of which were deemed unnecessary and superfluous. Chemical substances found in the lists, have attached to them their appropriate symbolic formulæ, as their descriptive phrase, derived from the last edition of Turner's Chemistry, which indeed has been relied on as the standard of authority of all chemical substances and principles contained in the work.

Governed by the principles above detailed, the Committee commenced the revision of the *Materia Medica*, and after each substance had been called up, examined, amended, or removed, such new substances also being introduced, as in their own opinion or from acknowledged authorities appeared to be needed, the whole subject was referred to a sub-committee of three, carefully to scrutinize, revise and perfect. From this sub-committee the amended list came, with its parts reduced to symmetry, its excesses lopped off, and its deficiencies supplied, and after having again been submitted to the ordeal of the whole Committee, the list now reported as the Standard Officinal List of *Materia Medica* for the U. S. *Pharmacopœia*, was adopted.

The list of indigenous and naturalized plants, having been also prepared with equal care, was in like manner adopted.

Reasons are given in the Journal of Amendments for every change and amendment which is proposed.

During the arrangement and preparation of the officinal list, other matters incidental to the general result were discussed and acted upon, and among others, it was resolved that each member of the Committee should provide himself with a copy of the U. S. Pharmacopœia, edit. 1830, and such other books of reference as he could obtain, and produce them at the meetings of the Committee;—consequent upon the passage of this resolution, was the presence at each meeting of several excellent works of reference, and standard authorities. The two lists having been completed, the consideration of other topics, whose position properly introduced them after the lists, was entered upon. These considerations embraced the subject of weights and measures, specific gravity, some general pharmaceutic directions, and a table of brief chemical directions, which should determine, by reagents, the purity of all chemical substances contained in the Pharmacopœia. The consideration of these subjects resulted in the adoption of the existing tables of weights and measures, with a slight amendment as regarded the weights; in the adoption of the terms of Baumé's hydrometer to be employed in common with the ordinary terms of specific gravity to express the density of fluids; and in the dispensing with general pharmaceutic directions, as inconsistent with the nature of a Pharmacopœia. The preparation of the chemical direction, a work of great labor, and requiring an intimate acquaintance with pharmacy and chemistry, no less than untiring industry and perseverance, was confided to a sub-committee of three, the chairman of which, Ambrose Smith, was aided by Thomas H. Powers and John C. Allen. Their labor has but just been completed, having proceeded *pari passu* with the general revision; and subsequent reflection has induced the Committee to assign to the directions a position following the preparations, instead of making them intermediate between that division of the work and the list, as was at first proposed. The value of such a table or digest, it is presumed no one can doubt. It affords a criterion by which the identity

of any chemical substance, included in the Pharmacopœia, whether the result of our own processes or derived from the manufacturer, may be perfectly established ; and as the work falls into the hands of many who, not being adepts in chemical science, are consequently unable to suggest the tests proper to be employed ; to such, its value is inestimable, as at once relieving them from any doubt, and removing any apology, which might otherwise be offered, for dispensing impure or adulterated medicines. It will be observed that the Committee have above specified what they determined to leave undone, as well as that which they thought proper to do. This course is deemed necessary, in order that where no action appears, such deficit may be shown to be the result of deliberation, not of oversight.

Some idea of the amount of amendment which the *Materia Medica* received, may be formed from the annexed statement showing the number of removals, additions, and alterations, of which that list has been the subject.

The number removed was,	55
" " and placed among preparations,	2
" amended,	82
" of new substances introduced,	65
	<hr/>
Total,	204

Of the number removed, fifty-four were taken from the secondary list, and but one from the primary. Of the fifty-four, the greater number found a place in the list of indigenous and naturalized plants. While those unchanged, amounted to one hundred and fifty-two ; showing that more than one-half of the list was entirely remodelled. Beside this statement, confined to the officinal list, there was a new list formed, comprising ninety-eight native or naturalized plants, not thought worthy of the officinal rank, and constituting a distinct list. To collate, correct, modify, and complete the above list, required an amount of labor, which can alone be estimated by those who have participated in the duty.

Previously to the final action of the Committee on the above subjects, they took into consideration, the manner in which they would proceed with the revision of the second grand division of the Pharmacopœia, containing the formulæ for preparations. On the 19th of May, it was resolved that the consideration of the preparations be divided among sub-committees, whose duties shall be to examine carefully the existing formulæ of the Pharmacopœia, which may be referred to each ; to compare the proportions employed, with those directed in other standard Pharmacopœias; to criticize the directions given for preparation; to append to each formula the equivalent of troy weight in equal parts; to recommend the introduction of such new preparations as they may deem necessary; to be careful in the arrangement and terms of new formulæ, in order to preserve the symmetry already existing, as well as in the employment of the nomenclature adopted; to indicate the removal to the Materia Medica list, of such preparations as they may think proper; to consult, such works as are especially regarded as standard; as Turner's Chemistry, London Pharmacopœia, Paris Codex, American Journal of Pharmacy, and Universal Pharmacopœia; and finally to seek the best information from every source, confirming doubtful opinions by experiment, and assigning reasons for every alteration and removal. Every member of the Committee of Revision, being expected to furnish to the sub-committee, of which he is not a member, any information or suggestion, in regard to subjects especially referred, which he might possess. Under this resolution the Committee was divided into three standing sub-committees on the preparations, which were distinguished as No. 1, No. 2 and No. 3.

Com. No. 1 consisted of Messrs. Ellis, Powers, and Smith.

" 2 " " Durand, Moore, and Procter.

" 4 " " Fisher, Allen, and Duhamel.

The above resolution, in its various branches, comprises in a compendious form all the principles by which the Com-

mittee were governed in effecting the revision of the preparations. To enable them systematically to promote the detail, a regular mode of proceeding was devised, and invested with the authority of by-laws for the control of the Committee. These by-laws were as follows:

"In revising preparations, each committee shall be called upon for its report, in its proper turn. The preparations shall then be taken up in alphabetical order, be discussed, amended, and adopted or rejected.

"The introduction of new preparations shall take place after all existing formulæ shall have been considered, when the Committee will decide what new formulæ shall be introduced.

"New formulæ, which may be reported in terms not symmetrical with those of the Pharmacopœia, shall be recommitted to the committee reporting them. The same shall be done with any preparation, not reported, in conformity with the resolution on that subject.

"All reports shall be in writing.

"It shall require at least two-thirds of the whole Committee to alter any amendment, or change any adopted substance after it has passed."

By these self-imposed rules, the Committee was regulated during its action upon this branch of the subject, and the great despatch and convenience which were found to result from the system, thus pre-arranged, fully justified the anticipations which had been formed of its effects. It will be utterly impossible here to show, how far the principles before laid down for the action of the Committee have been carried out, as such a detail would require a minute review, and analysis, of the revised Pharmacopœia, a comparison of all its formulæ, with those not only of our own, but the English and French authorities, and a complete repetition and renewal of the labor through which your Committee has just passed. But while such an analysis, and comparison, and repetition are impracticable, by which the fidelity of the Committee to the established principles, may be proven; they would respectfully again call your attention to the crowd of

specimens which they exhibit, the mass of documents which they present, and submit, whether such results could have grown out of idleness, ignorance, or inattention. Their great aim in the amendment of formulæ, has been to simplify them, to effect their correspondence with enlightened usages, and to render them as perfect as possible. In the introduction of new formulæ, they have been guided by the information derived from foreign authorities of standard value, as well as by the experience of the profession of our own country, as to the wants and usage of our own medical community. No amendment has been adopted without some good reason being proposed; no new formula has been introduced without some cogent necessity for its admission—change or novelty has never been a motive for innovation, nor has any preparation been hastily passed over, without deliberate examination and judgment. The report of each committee as it passed in review, was watched closely, and explanations demanded, or amendments proposed, before its sanction and the adoption of the Committee were awarded to it. Not one report, it is believed, passed this ordeal without some modification from its original shape, and at every meeting some recommitment, or special instruction to a sub-committee took place.

The number of sessions occupied with the consideration of preparations, was nine, during which the following results were produced.

The number of formulæ removed were	55
“ “ amended “	159
“ “ introduced “	113
“ “ left unchanged	94

By this statement it will be seen how extensive have been the grounds over which the Committee have passed; how much to the advantage of the 'Pharmacopœia, is neither for themselves nor for you to say; to determine this is assigned to another tribunal, which, it is believed, will find in the reasons given for every step, sufficient motive to admit the novelties and approve the amendments.

A great improvement, the Committee think has been effected in the introduction of equal parts, appended to each formula. The unequal system of weights existing in our shops, leads to the constant danger of the use of avoirdupois instead of troy weights, and this danger was greatly enhanced by the paucity which existed in the number of troy weights, to be found even in this city, a fact which rendered a nice calculation necessary where a formula was compounded, to convert the sole pile in the shop into its troy equivalent. This inconvenience, and the consequences which must inevitably flow from it, is obviated by the employment of equal parts, which, however determined, must still retain their relative value ; and effectually prevent the results, which must ensue from the substitution of amounts so entirely dissimilar, as those of the troy and avoirdupois weight, expressed by identical terms.

But perhaps the amendment of most value, independent of special modifications in particular formulæ, has been the introduction of the process of Displacement or vegetable lixiviation, in the preparation of a large class of formulæ, to which the experience of the Committee and others has found it admirably adopted. It was early determined that the use of this process must be adopted, and it became an anxious question with the Committee, to say whether one general description of the process should be prepared, and inserted in the former part of the work, or whether a detailed direction for its execution should follow each formula to which it was applicable. Objections existed to both. To the former mode it was opposed that pharmaceutical directions were inconsistent with a Pharmacopœia, as the Committee had determined by its own vote ; to the latter, there existed the inconvenience, monotony and tautology, of directions unwieldly in length, and in an almost identity of terms. The subject having been fully considered, it was finally concluded that an exception to the general rule was admissible in the case of this new process ; that it would be depriving the profession of a most valuable agent, and the country of an important

improvement, were the process of displacement withheld from the Pharmacopœia, until a longer period of time had familiarised the whole pharmaceutic community with its details, and thereby rendered so particular a description of it unnecessary; and the subject was referred to a sub-committee, to report a detailed direction of the process of displacement proper to be placed in that portion of the Pharmacopœia which precedes the preparations. This sub-committee, consisting of Messrs. Fisher, Duhamel, and Procter, reported such directions, which, after close scrutiny and amendment, were adopted, which, with the reasons assigned for their adoption, are entered upon the Journal of Amendments. Provided with this general description of the process, the pharmacist will be enabled to understand and fulfil the direction "to displace," as he is that "to filter" or to "crystallise." The adoption of this amendment, by the representatives of the National Convention, the Committee most earnestly desire.

The whole work, having thus passed through the hands of the Committee in detail, was referred to a sub-committee, consisting of Elias Durand, Ambrose Smith, and William Procter, Jr., who were instructed to revise the labors of the whole Committee. This sub-committee, immediately upon its appointment, proceeded to an examination of the work, reducing its parts to symmetry, correcting errors of inadvertence, modifying such formulæ as subsequent reflection indicated as requiring improvement, rendering every part consistent with the general design, and giving the last feature which was to be impressed upon its form.

After a careful consideration, the several objects of inquiry, as stated above, were brought before the Committee of Revision in a report which embraced every topic appearing to require a review. In general, a ready concurrence in their recommendations was yielded, and by this means the whole work has been rendered as correct as it has been in the power of the Committee to make it.

The Committee believe they have nothing further to add, in regard to the preparations, and will proceed to complete

their report with one or two miscellaneous topics remaining to be noticed. They have to mention, that at their meeting on the 2d of June they received with regret the resignation of their colleague, Thomas H. Powers, from the Committee of Revision, on account of his inability, from other claims upon his time, to attend to the duties. His resignation was accepted, and a continuance of his attendance at the meetings of the Committee requested. The vacancy occasioned in the Committee of Revision was filled by the election of Joseph C. Turnpenny, from whose counsels and experience the Committee has derived valuable aid. The vacancy in sub-committee No. 1, was supplied by the successor of Mr. Powers, and to that in the committee on chemical directions, the chairman of the Committee of Revision was assigned.

The Committee have now to bring before the College a statement of the expenses which they have found it necessary to incur, amounting to \$11.71. In making the outlay, the utmost economy, consistent with a satisfactory discharge of their duties, has been observed, and they trust that their action in this respect will meet the sanction of the College. The particular items for which the expenses have been incurred, are contained in the annexed statement marked—"Expenses."

Although the revision of the Pharmacopœia has been prepared exclusively at the instance of the National Convention, and by a resolution of the College is directed to be referred to the Committee to which other revisions have been referred, yet your Committee think it would be desirable that the Journal of Amendments and specimens, which have been prepared, should, after having been examined and acted upon by that Committee, be returned to the College; the written documents to be placed in the Library, the specimens to be deposited in the Cabinet. The preservation of the documents and specimens, the Committee consider of considerable importance, as affording a reference for our successors, and exhibiting the share which our Institution has contributed toward the formation of the National Pharmacopœia. By asking this return of the Journal of Amendments, it is not pro-

posed that the identical copy, now prepared for reference, should be that which it is proposed to preserve among our archives. On the contrary, the Committee regard the work, as worthy of engrossment in a more durable and elegant form; that the whole may be collected in one volume, with its title and the occasion of its preparation suitably inscribed. This hasty copy prepared with despatch for the service of the Committee of the National Convention, your committee consider not sufficiently dignified and imposing in its exterior, to form the first of the elaborate and finished series of "Revised Pharmacopœias," which they trust is to decorate and enhance the value of our Library. The Committee trust that the resolution which they present in regard to this subject will meet the approbation of the College.

One further topic remains to be offered for your consideration. It has been thought expedient that a committee of the College should be appointed to take charge of the Journal of Amendments and specimens, to convey them to the Committee of the National Convention, and to tender the further co-operation of the College, if a further joint action be needed. A resolution is appended, providing for the appointment of such a representation of our Institution, and awaits your approbation or dissent.

Before concluding, the Committee deem it not irrelevant or out of place to say, that in reviewing the result of their labors, and venturing a glance towards futurity, they could not but be struck with the importance of the consequences which may flow from the combined and harmonious action of the representatives of the two professions, now for the first time acting in open and intimate connection, for the exalted purpose of preparing a code that will insure to the community, through the agency of the medical and pharmaceutical corps, the aid to be derived from every late improvement.

Animated by the most philanthropic motives, each has brought to the task all the light which long and enlightened experience, mature and deliberate observation, ingenious and well-directed research could communicate, illumining and ban-

ishing darkness, raising the veil of obscurity, and dispelling error. Of the share which the profession of pharmacy is capable of contributing toward the amendment and improvement of a National Pharmacopœia, it becomes not us to boast; of the share which those who represent the medical profession will furnish, it becomes not us to judge; each will doubtless devote the best efforts of their professional skill to the undertaking; and an honorable and praiseworthy emulation will be excited in each, to effect, to the utmost of their abilities, the perfection of the great work which they have in charge.

Uninfluenced by prejudice, uncontrolled by partisan views, untrammelled by dogma, and unfettered by a veneration for mere antiquity, the results which must flow from the co-operation and concurrence of sentiment of the two professions, must be vast indeed. They must give a tone and character to the Pharmacopœia of the United States, which will endow it with the freshness and independence of an original work. It will be utterly exempt from the imputation of being derived from foreign authorities by a mere transference of the contents of their pages to our own; but, above all, and by far the most important advantage which is to be derived from the mixed commission, under which the revision has been effected, will be to insure uniformity of nomenclature, and identity of preparation, to a greater extent than any influence less than that of positive law, would enforce. For after all it must be borne in mind, that, in this country, it rests with the individual judgment of each apothecary to adopt or reject the formulæ of the Pharmacopœia, as they may meet his approbation, or obtain his confidence by the faith which he may place in the knowledge and capacity of those who may have had charge of their creation. The experience of every one will sustain this declaration. As the latter influence is that which in the main, governs the majority of those who are to employ the preparation, it follows that it is a matter of the last moment so to direct the composition of the board of review, as must effectually and certainly win the reliance of the large class, whose confidence must be secured if uniformity and identity

be indispensable. This can by no means, in our opinion, be so well obtained, as by the means adopted in the revision of the forth-coming edition, inviting the co-operation of our schools of pharmacy. A knowledge that those institutions have participated in the revision—that in all the points of view in which the pharmacist regards formulæ, these formulæ, now put forth for observance, have been examined, scrutinized and improved by those who have the interests and progress of pharmacy in charge, will do more to secure for the Pharmacopœia the individual suffrage and support, which ultimately are to approve or condemn. It would by no means be the design of your Committee to assert that the reputation of the work depends on this cause alone, but added to the character which it receives from the knowledge that the formulæ have received the examination and sanction of eminent members of the medical profession, and are, therefore, of such strength and proportions as will be approved in practice, a sure and important confirmation of it will be derived upon the same certainty that pharmacists have also shared in its production. Being designed for the use of two professions, it needs that two professions should have concurrent action in its creation. The physician will look to it as the work of a medical man; the apothecary will regard and value it as the work of pharmacists. The experience of the period which has elapsed since the publication of the last edition, fully justifies these remarks, and an appeal to the shop note-book and interlineations and comments which most Pharmacopœias contain, will prove beyond question, that improved as the edition of 1830 was over its predecessor, in every respect, there was still room for the information, which the experience of the shop could alone supply. This information the revised edition will contain, and the possession of that experience, the increased reliance which therefore will be felt in the directions of the Pharmacopœia, the consequent general adoption of it, the harmony of nomenclature, and the uniformity of preparation which it will insure, are unhesitatingly pronounced as important and vast, as they have been characterized.

Momentous as they are, and great as the amelioration to society would be, they depend in a great measure upon the value which may be placed upon the amendments emanating from the pharmaceutic institutions of the country, who have long since seen and regretted their inability to amend the defects. Alone, they possessed no other means, than the publication of a Pharmacopœia of their own, as a mode of remedy, which, however readily and heartily it would have been seized upon, would have appeared discourteous to the profession of medicine, would have created an apparent diversity of interests, and prevented the present alliance, fraught with so many causes of congratulation. Long may that alliance continue, and forever banish the necessity of a recourse to the mode of relief above indicated.

From the first steps having been taken by members of the medical profession, in framing a National Pharmacopœia, adapted to the wants of the country, and from no provision having been made by them, by which the profession of pharmacy could be associated with them, no general and material contribution toward the early Pharmacopœia was derived from the College of Pharmacy. The want of this aid was seen and admitted by the last Convention for revising the Pharmacopœia, and as one of the consequences of their action, ultimately has been produced the revised plan, submitted here by your Committee; and which, should it meet your approbation, will show to the medical profession, upon whose invitation we have acted, that naught was needed to induce us to furnish our experience, research, and professional knowledge, cheerfully and at large, but the assurance that our co-operation was valued and would be appreciated. That a respectful estimate was placed upon the service which we could render, that our amendments would be regarded as entitled to serious consideration, and that every proposition submitted by us would be received and disposed of solely on its own merits, were fully evinced in the terms and tone of the application from the representatives of the National Convention, addressed not only to our own,

but to the Colleges of Pharmacy in New York and Boston. The excellent feeling thus indicated, has been confirmed by the delay which it is known that Committee has suffered, from the length of time which our revision has occupied, and to which they courteously submitted, that they might avail themselves of our action on the subject. Were further grounds for confidence needed, that amendments emanating from our College would receive impartial and respectful consideration, that its recommendations are addressed to unbiased, unprejudiced minds, they are to be found in the character of those known to compose the Committee, to which our revision, in common with others, is to be referred, for intelligence, ability, professional knowledge, candour, and conscientious discharge of duty; to which may be added an identity in feeling with ourselves for the prosperity and honor of the Philadelphia College of Pharmacy.

The course which we may anticipate the Committee of reference thus characterized will pursue, will for ever remove any occasion for our separate and distinct action, for ever avert disunited and adverse councils between professions, whose ties are so intimate and close. But your Committee forbear further remark, having far exceeded the limits assigned at the outset, and pass to the last portion of their report.

The Committee of Revision part from their production and commit it to your hands, invoking your sanction for it, and the adoption of it as your own work. A feeling of melancholy pleasure attends this completion of their duty, while a lively feeling of satisfaction is excited at having reached the goal after a long though not tedious journey. Entirely inexperienced in the detail of revision, unguided by any precedent, by which their steps might be directed, the Committee commenced the task, pioneers in a great undertaking. Vast as was regarded the ground to be passed over, distant as appeared the terminous, and obstructed as their rout seemed to be, when viewed from its remote extremity, it was found to be capable of being traversed without difficulty, and to be unembarrassed

with the obstructions, which at first lowered on the view. Encouraging and aiding each other by counsel and support, by mutual concession and deference, the meetings of the Committee have been characterised with good feeling, confidence, and unanimity. No fixed adherence to predetermined views has ever marred the councils and prevented a general concurrence in the opinions and decisions of the Committee. Those who constituted the Committee have now no longer in prospect the pleasures of future deliberations and discussion, and it is thought important that you should be apprised that they part from each other with the most pleasant reminiscences of the many hours which they passed together in delightful intercourse, and that all will look with the most agreeable recollections to the good feeling and harmony which prevailed: creating intimacies, establishing confidence, and inviting regard, by developing the professional abilities, as well as social characteristics of their colleagues. For the many pleasures derived from this association, for the high trust deposited in their hands, and for the patient attention which their lengthened recital has received, they have to offer their acknowledgements to you, their constituents; and here resigning their trust, to ask at your hands, a discharge from further service.

All of which is respectfully submitted by

W. M. R. FISHER,

E. DURAND,

CHARLES ELLIS,

W. M. W. MOORE,

JOS. C. TURNPENNY,

JOHN C. ALLEN.

Philadelphia, Nov., 1840.

Whereas, The Committee of Revision, appointed on the 30th of March last, has reported to this body an amended copy of the United States Pharmacopœia, prepared in accordance with the provisions and instructions contained in the

resolution under which they were appointed; and whereas the Philadelphia College of Pharmacy has assented to the invitation to co-operate with the Committee of the National Convention, and has accordingly caused the aforesaid revision to be effected through the agency of its Committee; and whereas, the revised edition which the Committee present, has been the result of great labor, extended research, and is eminently worthy of preservation in a durable and appropriate form ; and whereas, the specimens exhibiting the results of improved formulæ, are also of value and entitled to preservation; and whereas, it has been found necessary that some expenses should be incurred by the Committee of Revision for the proper discharge of their duty; and whereas, the Committee upon submitting their report, ask their discharge,

Therefore, be it *Resolved*, That this College adopt the revision of the U. S. Pharmacopœia, prepared by its Committee, as its own act, and sanction the proposal of the amendments therein contained.

Resolved, That a committee of three be appointed to convey, in behalf of this College, to the Committee of the National Convention, the Journal of Amendments, and accompanying specimens illustrative of the result of amended formulæ, and also tender to the said Committee the further co-operation of the College, should such action be needed.

Resolved, That the College will regard said Journal of Amendments and specimens as its own property, and will expect their return so soon as the purpose for which they were prepared has been accomplished, and that the Secretary of the College be directed to procure an engrossed copy in one volume, properly entitled and labelled, and durably and handsomely bound, of the two Journals reported by the Committee of Revision, to be deposited in the library of the College. The specimens when returned to be placed in the cabinet.

Resolved, That dollars be appropriated to defray the expenses incurred by the Committee of Revision for the purposes indicated in the statement submitted by them.

Resolved, That the Committee of Revision be discharged from the further consideration of the subject.

Adopted.

List of Documents accompanying the Report.

1. Circular to Members and Graduates.
2. Correspondence.
3. Resignation of Thos. H. Powers.
4. Reports of Committees (miscellaneous.)
5. Reports of Committees on Materia Medica, preparatory to the completion of the list.
6. Complete Report of Committee on Materia Medica.
7. Plan of arrangement and Report on Displacement.
8. Reports of the Standing Committees on Preparations.
9. Report on Chemical Directions.
10. Report of Sub-committee of Revision.
11. Minutes of Proceedings, 1 vol.
12. Journal of Amendments, 2 vols.
13. Index to Journal of Amendments, 1 vol.

ART. LVI.—PHARMACEUTICAL NOTICES. No XXI.

BY AUGUSTINE DUHAMEL.

Consolidation of Copiba by Wax.

THE once common method of consolidating copaiba by means of calcined magnesia, has in a great measure given way to another and more convenient form of administration, under the well known name of capsules. The advantages of these last over the other, as regards convenience and nicety of administration, added to the certainty of ensuring the effects of pure copaiba, are so well understood and appreciated, as to render it a work of supererogation to repeat them here. With reference to the solidification of copaiba, it should be borne in mind that it is only under peculiar conditions that it will take place—for instance, the magnesia must be pure, and the copaiba old, having undergone a certain degree of inspissation. If fresh, and consequently rich in essential oil, a large quantity of magnesia is required to solidify it—and even then only at the expiration of a long period. A mass which we made more than six months ago, with as much as one-fourth of magnesia, is not yet sufficiently hard to retain the form of pill. If to obviate this, you subject it to heat or employ inspissated copaiba of a certain consistence, you readily obtain a solidified mass; but which, owing to its hardness and insolubility in the stomach, is as inefficient a remedy for the purposes intended, as ordinary resin would be, prescribed for similar uses. The only useful purpose to which we have been able to apply the soft or half-solidified mass has been to incorporate it with powdered cubebs, and thus prepare a compound pill of copaiba and cubebs. It requires, however, a very large proportion of the latter, to form with it a good pilular mass.

A better method is one, the idea of which is taken from a prescription of Dr. Berens, a German physician, now practising in this city. It is to dissolve by heat a certain portion of white

wax in the copaiba, and then incorporate with it the powdered cubeb. When cool, the mass will have acquired sufficient firmness to be divided into pills. Here is the doctor's prescription—

B. Ceræ alb. 3ij.

Leni calore liquefactæ et semirefrigerata adde agitando,

Balsam. Copai. ʒss.

Pulv. Cubebar. ʒj.

M. Fiant pilul. No. 240, consperg. pulv. lycopod.

These cerated pills of copaiba, are of good consistence and do not become hard like the other. Apothecaries should suggest this method to physicians, who are often at a loss when wishing to prescribe copaiba in the form of pills combined with other remedies to suit an emergency.

The good effects of this remedy in the case of delicate patients were in the majority of instances rendered unavailing, by reason of the disgust uniformly exhibited towards the taste of copaiba, until the capsules were introduced. These, however, do not admit of physicians prescribing copaiba united with other substances, as the empty capsules of gelatine are not to be obtained. Under these circumstances, the idea thrown out by the above prescription, may be worthy of some consideration.

Cicuta Plaster.

This plaster is not officinal in the London, Dublin, Edinburgh, or U. S. Pharmacopœias, though as respects the latter, it will probably become so in the forthcoming edition of that work. The following proportions taken from the Prussian Pharmacopœia, are such as may be employed with excellent results—

Yellow wax 2 oz. or 2 parts,

Resin 1 oz. or 1 part,

Olive oil 1 oz. or 1 "

Powdered cicuta leaves 2 oz. or 2 parts.

Melt the wax and resin in the olive oil over a gentle heat, (warm ashes,) after which strain and add the powdered leaves, stirring at the same time with a spatula, that the cicuta may be well incorporated. When cold, form the mass into rolls.

It is officinal in the French Codex; according to which, the fresh cicuta leaves are boiled for some time in the oil, then strained, and the other ingredients afterwards added. When good cicuta leaves cannot be obtained, half the proportion of well prepared extract will answer an equally good, if not better purpose.

Adulteration of Cantharides.

Though we are enjoined not to purchase cantharides in a pulverised state for fear of adulteration, it behoves us to examine such parcels as we may wish to purchase in the entire state, for a similar reason. Besides, the inert *Melolontha vitis* sometimes mixed with the genuine flies, we have met with a new subject of adulteration, not so nearly allied to the *Cantharis* in entomological classification, which were, however, pretty freely interspersed with them in a lot which we purchased without examination.

It is the *Cetonia*, vulgarly called Goldsmith, the shining golden green color of which resembles cantharides, and is calculated to deceive when mixed together, unless they undergo inspection. As they are large, and much heavier than the Spanish fly, it makes quite an object to a dealer, in the sale of a large quantity.

Fluid Extract of Senna.

In vol. 6th, page 274th of this Journal, will be found a recipe for this preparation, by Charles Ellis, who first introduced it to public notice. The attention of some of our physicians having been lately awakened to its convenience of administration, and finding it a certain and active preparation, far surpassing the infusion or confection of senna in point of general utility, we have had occasion to prepare it in considerable quantity to answer the demand. The improve-

ments made in Pharmacy since the publication of Mr. Ellis's formula have caused us to differ somewhat from the method of preparation as laid down by him, which, without additional, and even less trouble ensures a manifest advantage in the quality of the medicine. We have likewise at the suggestion of several medical gentleman, carried it to a higher degree of concentration, so that, as made by us, one ounce of the fluid extract represents $\frac{3}{4}$ j. of senna in substance, and consequently a table spoonful constitutes a good purgative dose.

By the method here given it is made in thirty-six hours—in the former way, twelve days is the allotted time for completion.

Take of Senna leaves coarsely powdered, { 32 oz. or 32 parts,
or bruised in a mortar,

Diluted alcohol 16° Cartier (one-
third rect. aleohol, two-thirds { 4 pts. or 64 "

water,)

Water, 1 gal. or 128 "

Sugar 20 oz. or 20 "

Oil of fennel, 64 drops,

Hoffman's Anodyne, q. s.

Mix the senna in a covered vessel with the alcoholic menstruum, and allow the mixture to stand over night. In the morning of the ensuing day put it into a Boullay filter and operate by displacement with the remaining aqueous menstruum until $1\frac{1}{2}$ gallons of liquid has passed. Then evaporate by a gentle heat to twenty fluid ounces, and, while yet hot, add the sugar that it may be dissolved. Strain to separate the mucilaginous matters coagulated by the heat, and when cold add the oil of fennel in the proportion of two drops to each ounce of extract, dissolved in a small quantity of Hoffman's anodyne. This last, besides serving the purpose of a solvent for the oil, prevents fermentation. The griping properties are in a great measure, if not wholly, prevented by the addition of the oil of fennel.

ART. LVII.—PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.

- I. Report of the Committee appointed at a public meeting of Chemists and Druggists, held at the Crown and Anchor Tavern, Strand, on the 15th of February last.*
- II. Address of the Council of the Pharmaceutical Society to the Chemists and Druggists of Great Britain.*
- III. Constitution and Laws of the Pharmaceutical Society of Great Britain.*
- IV. Pharmaceutical Transactions, Edited by Jacob Bell, Nos. 1 to 4, for July, August, September, and October, 1841. London, J. Churchill, &c.*

THERE appears, to a stranger at least, much confusion in the ranks of the medical and pharmaceutical communities in Great Britain. The English “Apothecary,” so called, is properly a dispensing Physician. With those amongst them who deal in drugs at all, medical practice is the principal object, selling and dispensing medicines a secondary one.

The medical practice of the “apothecary,” which, perhaps, was in its origin induced by the exclusive laws, which hedged around the entrance to the professions of the physician and surgeon, was long considered irregular, and their charges were not for advice and attendance given, but for medicines furnished to their patients.

This amalgamation of the duties of physician and druggist, seems to have had an injurious effect upon their standing in the community; the divided nature of their duties, disqualified them from rising to eminence, either as pharmacians, or practitioners, while their interference in medical practice, naturally awakened the jealousy, and provoked the opposition of the physicians. The opposition thus occasioned, tended to produce a closer union among the apothecaries themselves; and the accusation, constantly directed against them of selling bad medicines, gave an excellent pretext for the formation of

a joint stock company, and the establishment of a laboratory at their Hall, for their own use, and for supplying their members with drugs. The attention paid by them to the practice of medicine, naturally led to a neglect of pharmaceutical operations, and this circumstance, aided by the efforts of the physician, had the effect of bringing forward, in a more prominent manner, the retail chemist and druggist, or that portion of the apothecaries who abstained from medical practice. In 1732, the larger portion of the practice of the kingdom having fallen into their hands, the Legislature constituted the apothecaries, who now regularly studied physic, a medical body. By another act of parliament, passed more recently, (1813,) it is directed that twelve persons should be appointed by the Society of Apothecaries, to "ascertain the skill and abilities of such person or persons, (applying for certificates to practice as apothecaries,) in the *Science and Practice of Medicine*, and his or their fitness to *practice* as an apothecary, and they are empowered either to reject such person or grant a certificate of his qualification." None to be allowed, but to such as are twenty-one years old, who have served an apprenticeship of at least five years to an apothecary, and who shall produce testimonials of a sufficient medical education. The act also contains directions with respect to their preparing and dispensing medicines, imposing certain penalties upon them, in case they refuse to prepare, or unfaithfully compound the prescriptions of physicians. Thus it will be seen, that the law, fully recognizing them as practitioners of physic, considers them, also, as dispensers of medicine. They appear, however, to be generally dropping the pharmaceutical portion of their duties; many of them, indeed, now call themselves "General Practitioners," discarding the title of apothecary, which of right belongs to the retail chemist and druggist, whose establishment is the true *ἀποθήκη*.*

* *τίθημι* (to put or place,) *'ἀπό* (from, or away,) whence the noun *'ἀποθήκη* (apotheca) a repository,] and [the] modern Latin word *apothecarius*, a keeper of a repository of things laid up for special uses.

That the separation between the two professions should be as complete and wide as possible, is no doubt demanded by the true interest of both.

The chemist and druggist has hitherto been free from any special legislative enactment; but an attempt has recently been made to pass an act, (known as "Mr. Hawes' bill,") through parliament, to bring them under legislative control and prohibit them, under penalties, from prescribing at their counters. Although the more respectable among them avoid, as much as possible, giving medical advice in any way, they contend that severe legislative restrictions would be attended with injustice, or at best be ineffectual. That it is in fact a part of their duties, to be conversant with the doses and properties of medicine, and to communicate that knowledge when called upon; that it would be unjust to punish the druggist for doing that which every vender of merchandise is allowed to do, explain the uses and describe the properties of the article in which he deals. That if giving advice in simple cases, is to be made a felony, few benevolent individuals, and no old women in the kingdom, would be safe from fine and imprisonment; and that equity requires, if the chemist and druggist is, by law, to be excluded from the practice of the apothecary, the apothecary in like manner should be forbidden to interfere in the province of the druggist, by the sale of medicine.

The efforts of the chemists and druggists to prevent the passage of this bill, by bringing them in contact with each other, for the purpose of united defence, has taught them the necessity of association, for the protection of their interests as a community, and has generated a degree of esprit du corps, in which feeling, they appear to have been hitherto remarkably deficient. The advantage found to result from the partial union thus produced, together with a general conviction of the necessity of some authorized supervision, caused the germ of the "PHARMACEUTICAL SOCIETY OF GREAT BRITAIN," of which the papers cited at the head of this article, contain the initiatory reports, &c., together with the earlier numbers of a

monthly journal, instituted to advocate its formation, and publish its proceedings. The first is a report from a committee, consisting of the leading London chemists and druggists, of which Joseph Gifford was chairman, to a general meeting of the trade, recommending their organization as a professional body, and the establishment of an institution to promote the improvement of pharmacy, and maintain the interests of the chemists and druggists of Great Britain.

After detailing their successful opposition to Mr. Hawes' bill, the committee say :

" In the progress of their proceedings your Committee ascertained that the College of Physicians, the College of Surgeons, and the Apothecaries' Company had conjointly proposed obtaining some legislative enactment, by which the chemists and druggists were to be, for the future, placed under the government and control of these learned bodies, more especially of the Society of Apothecaries.

A deputation from your Committee, therefore, sought and obtained an interview with the College of Physicians and the College of Surgeons, respectively, and received from the former an official notification that it was their intention to introduce into their proposed measure of medical reform, a provision by which the chemists and druggists should thenceforth be placed under some legislative control; and your Committee have, therefore, again assembled you for the purpose of receiving new instructions and enlarged powers to meet present and future circumstances.

Your Committee having considered the subject, are of opinion that the chemists and druggists are capable of self-government; they, therefore, recommend that [the chemists and druggists of the Empire should immediately form themselves into a permanent Association, to be denominated the "PHARMACEUTICAL SOCIETY OF GREAT BRITAIN," having for its object the union of the members of the trade into one body—the protection of the general interests—and the improvement and advancement of scientific knowledge. As the basis of such union, your Committee would recommend the adoption of Education, Examination, Registration, and Representation as involving beneficial results to the Public in general, and to the chemists and druggists in particular; and offering to the existing medical corporations, and to the medical profession at large, a guarantee, that whilst the chemists and druggists are anxious to retain their present privileges, they are disposed to afford every public evidence of their fitness to exercise them."

The proposition of the Committee was adopted, and the meeting forthwith organized themselves into a Society, of

which the Committee were appointed the first Council, of which W.M. C. ALLEN, F. R. S. is President, CHARLES JAMES PAYNE, Vice President, RICHARD HOTHAM PIGEON, Treasurer, R. A. FARMAR and G. W. SMITH, Secretaries.

The Council commenced their efforts by issuing an Address to the Chemists and Druggists of Great Britain, soliciting their co-operation and support. A portion of the address we subjoin, which will show the views with which they entered upon their labors.

"Chemists and druggists have long had reason to regret the want of a union of their influence for mutual benefit and protection, and of a uniform education and internal government among themselves, as a means of substantiating their claim to public confidence; being conscious that as long as these defects exist, they may expect to be assailed by obnoxious imputations on the part of those medical reformers who are endeavoring to enforce a system of extraneous restrictions and supervision.

If 'the trade' is to be protected merely *as a trade*, and Acts of Parliament professedly designed for its reformation are to be opposed solely on the ground of self-interest, the task of self-defence will be endless and probably unsuccessful, while the exertions wasted on such struggles can reflect no credit on the spirit or integrity of those who are thus engaged; but if, aware that some regulations may be required, we endeavor to supply the deficiency, which is urged as a pretext for hostile proceedings, we shall secure ourselves against the possibility of persecution.

The importance which chemists and druggists have obtained as a branch of the Medical Profession, the reputation which many among them have acquired individually in their own department, and the great accession of numbers which now swells their ranks, *demand* the establishment of some judicious regulations which shall place them in a safe and creditable position as *a body*.

Those among us who take a real interest in our scientific art, rejoice at the opportunity which is now afforded of placing the 'trade' of a chemist and druggist on a professional footing, and effecting a union of our scattered forces for mutual benefit and advancement. By these means, talents, which have hitherto lain dormant, will be excited into action, a harmonious intercourse will take the place of reciprocal jealousy and distrust, and all the collective influence we possess will become available in attaining the desired improvement among ourselves, and resisting encroachments or interference on the part of others.

The Council are particularly desirous of overcoming the impression, that a voluntary society cannot effect these objects. They consider that

it will, in the first place, concentrate their power of self-defence, and be the means of distinguishing those who aspire to a high standard of qualification from the careless and indifferent; and, secondly, that by introducing a system of government conducive to the welfare of the public, it will form a basis for any legislative measures which may hereafter be adopted."

They drew up a Constitution and body of laws for the government of the Society, which were adopted at a subsequent general meeting, of which we give the principal features.

"The Members of the Society shall consist of,

1. Chemists and druggists who are, or have been established on their own account, and who shall severally subscribe the sum of two guineas annually.
2. Confidential Superintendents, who shall be elected by the Council, and who shall severally subscribe the sum of two guineas annually.

(The sum of twenty guineas, subscribed in one payment, shall be received in lieu of the annual subscription.)

Honorary and Corresponding Members, comprising such medical and scientific men as have distinguished themselves in any of the branches of knowledge embraced in the educational objects of the Society, shall be elected by the Council, but shall not be allowed to be present at any general meeting.

ASSOCIATES.

Assistants shall be admitted as associates who shall pay the sum of one guinea annually; and shall be entitled to all the benefits of the Society, excepting the right to be present at any of the general meetings, or to hold any office in the Society.

APPRENTICES.

Apprentices who shall be duly registered, and who shall pay the sum of one guinea annually, shall have the privileges of Associates.

EDUCATION AND EXAMINATION.

The educational objects of the Society shall embrace the following subjects:—An Elementary Classical Education—Medical Botany—Chemistry—Materia Medica—and Pharmacy.

After the 1st of July, 1842, no person shall be admitted as a Member, or Associate of the Society, without having passed an examination in the above branches of knowledge; and after that period no Apprentice shall be entitled to the privileges of an Associate without having, before the

execution of his Indentures, passed an examination in Classical Education. The said examinations and the registration of indentures shall be subject to the payment of such fees, and the granting of such certificates, as the Council may, from time to time, determine. But all present Assistants and Apprentices, who shall be registered before the above date, shall be exempted from the above restrictions, and shall be eligible as original Members, when they shall have commenced business on their own account.

It shall also be in the power and discretion of the Council to admit as Members, without Examination, after the above period (upon the payment of an entrance fee) such chemists and druggists as have been actually in business on their own account, prior to the above date, but who may have neglected to become Members."

The government of the Society to be vested in a Council, elected at the general meeting of the Society which is to be held annually. There is also a benevolent fund to be provided by specific subscription. From the Report of the Committee appointed to draw up the Constitution, we make the following extracts.

"The influence which chemists and druggists possess as a body when their efforts are combined, has been demonstrated in a manner which affords every encouragement to perseverance. It is equally manifest that if they relax in their exertions, or allow any minor consideration to interfere with the zealous and harmonious performance of the duty which they owe to themselves, they will inevitably sacrifice their independence, and be deprived of many of their existing privileges, by becoming subject to extraneous jurisdiction. It must be recollect that the Society is of a public nature, and involves the prosperity of chemists and druggists as a body throughout the kingdom. It is only by the combined and continued efforts of individuals that a scheme so comprehensive and laborious can be effected; and these efforts to be successful, must be supported by all those who are interested in its accomplishment."

"To chemists and druggists now established, this Society offers the means of extending Pharmaceutical knowledge by the establishment of a recognized medium through which discoveries and improvements may be promulgated; whilst the institution of a School of Pharmacy—the developement of scientific acquirements, and the exhibition of existing talent, will tend to confirm the confidence of the public, and remove our apparent deficiency as Pharmacopolists, when compared with other nations."

"The establishment of an examination in the Classics, for all future

Apprentices, will ensure the possession of that preliminary education which is essentially necessary for the creditable performance of their duties, and their ultimate success as Pharmacists; and the increased importance and respectability which will be conferred upon Pharmacy by means of the Society, will induce many of the more wealthy classes to devote themselves to its pursuit."

"The Committee have the satisfaction of stating that a communication has been received from Paris, intimating a desire, on the part of some of the leading members of the Society of Pharmacy in that city, to establish a scientific correspondence with 'The Pharmaceutical Society of Great Britain'; an overture of a similar character has been made on behalf of the College of Pharmacy in Philadelphia. The chemists and druggists of Scotland and Ireland have also expressed considerable interest in the undertaking.

"Your Committee, therefore, congratulate you on the circumstance, that, although the chemists and druggists of Great Britain united in the first instance merely for the purpose of self-defence, in support of their acknowledged rights, that union has resulted in the creation of a National Institution for the advancement of Pharmacy, which will be enabled to carry on a correspondence with similar institutions throughout the world."

A regard for brevity compels us to omit some portions of these reports which we would be glad to extract, but we believe we have given enough to show, that the Institution is commencing with a fair prospect of being sustained with much zeal and energy.

One of the means which the Society has adopted for the advancement of the scientific interests of the profession is the institution of stated "pharmaceutic meetings," at which papers are read and subjects discussed connected with pharmacy. Among these papers are "Observations on the Constitution of the Pharmaceutical Society of Great Britain," by Jacob Bell; "Sketch of the rise and progress of Pharmacy," by Mr. Morson, of both of which we have availed ourselves in compiling this notice; "On the preparation of Iodide of Iron," by Dr. A. T. Thompson; "On Vegetable Extracts," by Mr. Morson; "Decoctions and Infusions," by Mr. Bell; "Displacement," by Mr. Deane; "Vesicating Applications," by Mr. Redwood; "Diabetic Urine," by Joseph Smith;

"Marsh's Instrument," by Dr. Thomson; "Expressed Juices," by Mr. Squire; "Ung Hydr. Nitratis," by Robert Alsop, &c. Some of these papers will be found in a subsequent portion of this Journal, and of others we shall give abstracts.

That an organization of the pharmaceutical profession has not been before effected in England, or at least in London, is to us a matter of much surprise, and to this may, in some degree at least, be attributed the undeniable fact, that in the cultivation of pharmacy as a science, the pharmaceutists of Great Britain are much behind their neighbors on the continent. In pharmaceutic chemistry [and organic analysis, the science of France and Germany is far in advance of England, because pharmacy in the latter country is scarcely cultivated as a scientific profession.

We trust that in the energy, judgment, and professional spirit which is thus far displayed by the Council and active members of the new Pharmaceutical Society, we see the dawn of a more brilliant epoch, when the pharmacian of Great Britain will take that rank in the scientific world, which the eminence of his countrymen in almost every other pursuit, justify us in expecting him to attain.

If the true estimate of the capabilities and respectability of his own profession was duly held, there would be less disposition to step out of his own ranks, and interfere in medical practice. There is ample room in the field of pharmaceutic research, to give scope to the most active and comprehensive intellect; renown enough yet to be acquired, to gratify any properly regulated ambition. Any thing which looks like trenching upon the province of the physician should be discountenanced, and a proper spirit of independence and self respect cultivated. The time has passed, for the one profession to be considered as subservient to the other; where mutual assistance is required, mutual respect is due.

Not the least gratifying evidence of the spirit with which the active members of the association have entered into the cause, is the establishment of the monthly Scientific Journal,

before referred to, bearing the title of "Pharmaceutical Transactions," of which we have the first four numbers before us. It is edited by Jacob Bell, an active and able member of the Council, and published for the present by him, on his own responsibility, as an experiment; although it is, no doubt, to be considered as the organ of the Society, and will be officially adopted as such, when the Institution becomes fully organized. It contains the proceedings of the Society, the papers read at the Scientific meetings, pharmaceutic and general scientific intelligence, &c. We observed in it extracts from our own Journal, and in return present in the present number selections from it, and as its only collaborateur, in the same language, we heartily bid it welcome. Such a journal has long been wanted in England; we trust that it will be efficiently and cordially sustained.

A. S.

ART. LVIII.—OBSERVATIONS ON BLISTERING PLASTER.

BY WILLIAM PROCTER, JR.

THE importance of having this preparation of such decided activity, that it can be depended upon, particularly in extreme cases, can readily be appreciated by medical men. That the continuance of life sometimes hangs on the efficiency of this agent, will be hardly disputed, and any addition to its power should certainly claim the consideration of the physician, who has the interest of his patient at heart; and of the pharmacist who is jealous of his good reputation.

Having occasionally had blistering plasters to fail in producing vesication, notwithstanding the cantharides which entered into their composition were of good quality; and having experienced the mortification of hearing a report of their failure from the patient or his physician, the writer, after some experiments on this subject is led to believe that blistering plaster, made from good flies, often fails in producing its peculiar effects, owing to the manner in which the preparation is made and applied.

The first point to be attained, is, in all cases, the possession of Cantharides of known excellence, very finely divided.

The next is presenting them in a vehicle which will readily hold their active principle in solution, and which, when applied to a surface, will be active at every part in contact with it; at the same time that it will retain consistence enough to prevent it from spreading when heated by the skin.

And lastly, it is of great importance that the material employed on which to spread the plaster, be of such a character as not to absorb the fluid part of the cerate, and thus deprive it of its adhesive power as well as much of its activity.

An error which has been generally countenanced by writers on this subject, is that flies are liable to be injured by the heat

of the melted ingredients at the temperature that they usually are when removed from the fire. On the contrary, it is highly probable that a cerate made by adding the flies, just when the other substances are removed from the fire, would be more active, than one made by adding them after the melted ingredients begin to thicken.

Cantharidin, as stated by Thenard (*Traite de Chimie, &c.*, tome iv. p. 592,) fuses at 210° C., (410° F.) and heated more strongly, it is *sublimed* in brilliant needles, but a small part being decomposed.

To ascertain if it was really true that oil at the high temperature above stated, exercised no injurious effect on the active principle of Cantharides, a solution composed of one part of Cantharidin to 100 parts of olive oil was heated until the oil began to vaporize. A portion of this solution, after cooling, was applied to the writer's arm, and in eight hours the surface to which it had been applied was in a state of vesication. Thinking that possibly the matter associated with Cantharidin in the flies might exercise an injurious influence on that principle, when exposed together to a high temperature, a portion of the cerate was heated to 325° Fahr., when its whole surface was in a state of ebullition, extricating offensive vapors, which were probably some substance in the fly, volatile at that heat. It was then suffered to cool, and a portion applied as before, to the writer's arm for *three hours*, when partial vesication had taken place, followed in a few hours by a copious secretion of serum. Was any further evidence necessary, the preparation called "*decoction of Cantharides*," made by subjecting the Cantharides in powder to long continued heat in oil of turpentine, at a temperature considerably above that of boiling water, might be adduced.

It is hardly probable that under any ordinary circumstances, the vehicle would be heated as high as 300° Fahr., and consequently the active matter of the flies would remain uninjured.

The fluidity of the vehicle for the application of Cantharides is a subject of much importance, as on it depends in a great

measure, their effects. Hog's lard is frequently employed, and in many respects it is an excellent material. Its fusing point is about that of the temperature of the human body; it is economical, and when olive oil cannot be obtained, it is a proper substitute.

Olive oil possesses all the requisites, and is the correct menstruum.

Oil of turpentine, so far as regards its being a good solvent for Cantharidin, is very suitable, and makes an active preparation, as has been ascertained by experiment, but its volatility precludes its use *per se* in this preparation, because it gradually evaporates and leaves the cerate too stiff. The sequel will demonstrate that a combination of the two last substances, affords the most eligible menstruum for extracting the activity of Cantharides, as relates to the preparation under consideration.

The following formula is proposed, and the numerous instances, in which the activity of the Cerate which it yields, has been tested, gives confidence to the writer in thus making it public—

Take of Cantharides in fine powder,	3vj.
Olive oil,	3vj.
Oil of turpentine,	3ij.
Yellow wax, Resin, of each,	3iv.

Mix the Cantharides with the olive oil and oil of turpentine in a suitable vessel, place the mixture on a water bath, and continue the heat until the turpentine has nearly all evaporated, which requires six or eight hours, and stir it occasionally during that period. Then add the wax and resin, previously melted together; and continue the heat until they are thoroughly incorporated, and finally remove the vessel from the bath and stir them constantly until cool.

The object of adding the oil of turpentine is to increase the quantity of the vehicle, and thus sooner and more effectually to dissolve the Cantharidin; and its volatility affords a

ready means of getting rid of it after it has performed that function. The proportion of olive oil is rather greater than in the *Pharmacopœia*, but it is believed to be properly increased.

Vesication, has been produced in several instances in two hours, and from that to six has been the period found necessary for its complete action.

Since writing the above, my attention has been turned to some observations on Cantharides by Joseph Scattergood, (*Jour. Phil. Col. Pharm.*, vol. iii. p. 212,) which go to confirm the above conclusions respecting the action of heat on Cantharides. He proposes an ointment made by decocting blistering flies in olive oil, straining and then adding sufficient wax to render it of the proper consistence. This preparation, though an elegant one, would be weaker than that now proposed; and besides, by removing the flies more space is left for the ill effects of careless manipulation.

Notwithstanding various substitutes for cerate of Cantharides have been proposed, such as a decoction in olive oil, a solution in acetic acid, &c., yet it is hardly probable that that preparation will be superseded, and hence the importance of improving it.

The attention of pharmaceutists has hardly been sufficiently attracted toward the influence of the material upon which the cerate is spread. The article usually employed is sheep skin, which, from its porous character, absorbs much of the vehicle, and sometimes leaves the surface of the plaster so dry as to prevent its adherence and activity. The material should, therefore, be soft and yielding, at the same time that it should not absorb the oil from the cerate. Oiled silk, which possesses all these requisites, is now proposed as a substitute for sheep skin. The small difference in the cost of the two should not counterbalance the employment of the former, when accompanied by such great advantages.

ART. LIX.—ON VESICATING APPLICATIONS.

BY MR. REDWOOD.

Read before the Pharmaceutical Society of London.

THE estimation in which blisters are held as therapeutic agents, and the objections which are urged against those in general use, seem to claim our attention to this class of remedies, with the view of establishing principles upon which their preparation may be improved.

The London Pharmacopœia contains two formulæ for vesicating applications, under the denominations of "Emplastrum Cantharidis," and "Acetum Cantharidis;" and the former of these has for many years been adopted by the Colleges of Edinburg and Dublin, as well as by the London College, and constitutes the officinal blistering plaster of the shops. This plaster requires to be applied for about twelve hours, in ordinary cases, before the full effect is produced, and in many instances a still longer application than this is necessary. To meet the objection which this delay would sometimes offer, recourse has been had to more active and speedy means of producing the same effect. The Acetum Cantharidis is intended as an agent for this purpose, and the Emplastrum Cantharidis Compositum of the Edinburg College will come under the same class.

These are the vesicating applications ordered in our Pharmacopœias, but others are sometimes resorted to in practice. Boiling water offers a ready means of raising an instantaneous blister, which is adopted by some practitioners; and strong acetic acid and solution of ammonia have also been used with the same view. Mustard seeds, applied in the form of poultice, possess powerful epispastic properties, as do also the essential oil of black mustard seeds, and the oil of croton tiglum; and these, together with numerous other acrid vegetable substances, have at different periods been employed, either alone or in

combination. The Emplastrum Epispasticum of the London Pharmacopœia of 1668, contained no less than fourteen ingredients, among which were mustard, euphorbium, long pepper, stavesacre, pyrethrum, cantharides, gum ammoniacum galbanum, bdellium, and sagapenum, with turpentine, resin, &c. The greater part of these ingredients, however, have long been discarded in applications of this description; and, although the Edinburg College still order turpentine burgundy pitch, acetate of copper, mustard seeds, and black pepper, in addition to the Cantharides, in their Emplastrum Cantharidis Compositum, the advantage of such heterogeneous mixtures may be doubted. Indeed, the remark of Dr. A. T. Thomson with regard to this latter preparation, that "its operation is accompanied with very great pain, and a pungent sense of heat," and "is apt to cause very unpleasant ulceration if allowed to remain too long applied," would seem to sufficiently indicate the propriety of finding a substitute for so violent a remedy.

Messrs. Pugh and Plews, of Edinburgh, several years ago, introduced a preparation, under the name of Chemical Blistering Fluid, which they recommended as a substitute for the common blistering plasters. They describe it as producing its full effect in three hours, and say, "it is found also that the burning heat, great thirst, general irritation, strangury, and other unpleasant effects, so frequently attendant upon the application of the old blistering plaster, are avoided by the use of the Chemical Blistering Fluid. It is not only easier and cleanlier in its application, milder, and more efficacious in its action, than the fly blister, but the skin, after its use, is much more easily healed; and it may be reduced in strength so as to render it applicable to the tender skin of infants, which the old blister cannot be."

This preparation appears to be similar to the Acetum Cantharidis of our last Pharmacopœia, which is described by Dr. A. T. Thomson, as intended "for raising a sudden blister." The formula of the London College is, two ounces of powdered Cantharides to one pint of acetic acid, macerated for eight days and strained. It is generally directed to be used, by

applying to the skin a piece of lint wetted with the fluid, and covering this with adhesive plaster. I have found the blistering fluid of Messrs. Pugh and Plews to be of the same strength as the Acetum Cantharidis of the College. The specific gravity and saturating power of the samples tried were as follows:

	SP. GR.	GRAINS
Blistering Fluid (Pugh and Plews)	1.060	{ carb. soda required to saturate 100 grains } 71
Acet. Canthar. (Bell and Co.)	1.061	" 72
Ditto (Herring Brothers)	1.060	" 71

But this liquid blister, while it may possess advantages in some respects, yet is frequently complained of, as uncertain and sometimes ineffectual in its operation. The Acetum Cantharidis, prepared by houses of the highest standing, and who profess strictly to follow the formula of the College, is generally found to be deficient of that vesicating power that would entitle it to the appellation of a speedy or instantaneous blistering application, and hence it often fails to meet the expectations of the prescriber. The physician being thus disappointed in the looked-for effect, too often ascribes the cause of the failure to the fault of the chemist; and the latter is, perhaps, no less disappointed and mortified, on being informed, when the prescription is next presented at his counter, that the blistering application has been directed to be obtained from some neighboring chemist, who has gained the physician's patronage, by carrying out his intentions more successfully than the formula of the College of Physicians would enable him to. This has been effected by preparing the Acetum Cantharidis with acetic acid nearly three times the strength of that ordered by the College. Beaufoy's Concentrated Pyroligneous Acid corresponds as nearly as possible with the "acidum aceticum" of the Pharmacopœia. The specific gravity is 1.048. One hundred grains of this acid will saturate eighty-seven grains of crystallized carbonate of soda. It consists of 30.8 of anhydrous acid + 69.2 of water.

As it is probable that the concentrated pyroligneous acid of commerce is frequently used for the acidum aceticum of the College, and as the pyroligneous acid supplied by different manufacturers is of very different strength, it is important in the preparation of *Acetum Cantharidis*, that the specific gravity and saturating power of the acid should be tested before using it.

Mr. Garden, of Oxford-street, and, I believe, some others, employ acetic acid of about the strength of aromatic vinegar for making the *Acetum Cantharidis*. 100 grains of Mr. Garden's *Acetum Cantharidis* required 198 grains of crystallized carbonate of soda for its saturation. This is, of course, a much more active application than that ordered by the College, and will often raise a blister in ten minutes; but although prepared with so strong an acid, it is still uncertain in its operation, and thus an hour or more is in some cases required to produce the same effect, that in others, would result in a few minutes. In a preparation of *Cantharides* this uncertainty appears remarkable, for one of the great advantages which the blistering fly is considered to possess over all other epispastics, consists in the certainty and uniformity of its operation. The action of the *Acetum Cantharidis* seems to be distinguished less by the characteristics which belong to *Cantharides*, than by those of acetic acid. So much indeed is this the case, that on my attention being called to the variable strength and uncertain operation of this remedy, I was soon induced to suspect that it owes its vesicating power chiefly, if not entirely, to the acetic acid. Subsequent experiments have tended to confirm this opinion.

Dr. A. T. Thomson, in his *Dispensatory*, describes the *Acidum Aceticum* of the *Pharmacopœia*, as "a useful and powerful substitute for a blister, when the effect of such an application is required to be rapidly obtained," and I believe that pure acetic acid will be found to possess all the efficacy of *Acetum Cantharidis* made with acid of the same strength. the following are the experiments upon which this opinion is founded:

Acetum Cantharidis was made according to the formula of the London College, and samples of the same were obtained from some of the first houses in town. The specific gravity of these varied from 1.059 to 1.061; 100 grains required from 70 to 72 grains of crystallized carbonate of soda for saturation. They were found to be of equal vesicating power; producing a blister in about three hours, when applied to the arm under a piece of adhesive plaster.

Experiment 1.—Acetum Cantharidis was carefully evaporated at a temperature not exceeding 100° Fahr., until reduced to the consistence of an extract. This had a bright transparent reddish brown appearance, with a slight smell of Cantharides, and a strong acid, not unpleasant taste.

Experiment 2.—A small quantity of the product of Experiment 1, was neutralized by the addition of a few drops of solution of ammonia, then spread on a piece of adhesive plaster and applied to the skin of the arm for twelve hours. No sensible effect was produced.

Experiment 3.—A small portion of the product of Experiment 1 was neutralized with carbonate of soda, and applied in the same manner as last experiment, with the same result.

Experiment 4.—A portion of the product of Experiment 1 was washed with distilled water to remove the free acid, and the residue applied to the skin for twelve hours, without any effect.

Experiment 5.—The product of Experiment 1 was exposed to the atmosphere until the acetic acid was nearly all evaporated, and then applied to the skin as before for twelve hours, a slight redness of the skin was produced.

Experiment 6.—Acetum Cantharidis was neutralized with carbonate of soda, then carefully evaporated until crystals of the acetate of soda were formed, and afterwards digested for three hours in rectified ether, with frequent agitation. The ether was then decanted off and allowed to evaporate spontaneously. After the evaporation of the ether, a very minute portion of yellow liquid was left, which reddened litmus

paper. This liquid applied to the skin for twelve hours produced no effect.

Experiment 7.—Acetum Cantharidis was mixed with an equal quantity of ether. The mixture was frequently agitated and left to stand for twelve hours. The ether was then decanted off, and allowed to evaporate spontaneously. A light yellow acid liquor remained, which on further evaporation afforded some appearance of crystallization. Two or three drops of oil being mixed with this, it was applied to the skin for twelve hours, but produced no effect.

Acetum Cantharidis, obtained from Mr. Garden's, was submitted to the same experiments as the foregoing; 100 grains required 198 grains of carbonate of soda for saturation. On evaporation, as in Experiment 1, it afforded a dirty brown residue, amongst which were perceived globules of green oil. When deprived of acid and applied to the skin, it caused slight irritation. Neutralized with soda and then digested in ether, as in Experiment 6, it yielded, on the evaporation of the ether, a bright green oil, which, applied to the skin for twenty hours, caused a slight redness on the part, but no blister.

These experiments were repeated several times with the same result. They seem to indicate that acetic acid, of the strength ordered in the Pharmacopœia, is not a solvent of Cantharidin. In order more completely to determine this point, some pure Cantharidin was prepared according to Robiquet's process. It was found to be insoluble in acetic acid. Again, the residue of the flies, after the preparation of Acetum Cantharidis was digested in ether, and the oil obtained on the evaporation of the etherial tincture, when applied to the skin, raised a blister in fifteen minutes.

It is evident, therefore, that acetic acid is not a proper menstruum for exhibiting the acrid principle of the blistering fly.

In referring to another preparation of the Cantharis, namely, the Unguentum Cantharidis, we shall, perhaps, be enabled to account for the difference of opinion which exists respecting

its efficacy, by making, in this case, a somewhat similar investigation to that which we have just been pursuing. The Cantharides ointment is intended as a mild stimulating application for keeping up the discharge from a blistered surface. In many cases, however, it is found to be entirely void of acrimony, and, therefore, inapplicable for the purpose designed; whilst, in other instances, it proves too stimulating. This ointment is made by boiling the flies in water, and making an ointment from the inspissated decoction. Now, boiling water is capable of extracting the whole of the acrimony from the flies, and if, therefore, in the preparation of Unguentum Cantharidis, the decoction be carefully evaporated, without using much heat, the product will be sufficiently active to raise a blister. This I have proved by experiment to be the case. But the heat generally employed in effecting the evaporation, destroys all or nearly all the acrid principle of the fly, and often renders the ointment of little use.

Thus the strong blistering fluid is made by extracting from the fly, and preserving for use, an inert viscous matter, together with some salts of lime and magnesia, which the insect contains, and throwing away the cantharidin or blistering principle; while in the process for making the mild blister dressing, the active principle is retained, and the more inert matter rejected. In the former case, the efficacy of the preparation depends upon the acetic acid, which is the menstruum used; and, in the latter case, the ultimate attainment of the object intended, that is, the production of a mild ointment, is due to the decomposition or dissipation of the cantharidin during the evaporation; and as this will take place in proportion to the heat employed, the result must necessarily be uncertain and variable.

The celebrated Boerhaave proposed an amendment upon the Unguentum Cantharidis, by reversing the process. He recommended that the flies should be powdered, boiled in water, and strained; that the aqueous decoction be thrown away, and the residue of the flies be dried, finely powdered, and formed into a pomade, in the proportion of twelve to

sixteen grains of the powder to one ounce of ointment. Boerhaave ascribes to this ointment the property of keeping up the discharge from a blister, without producing that irritation found to result from the use of ointments, containing Cantharides in their natural state. It seems, therefore, that this ointment is intended also as a substitute for our ceratum lyttæ, which is a mixture of powdered Cantharides and simple ointment.

But although it would appear that the constitution and properties of the blistering fly have been partially overlooked, or imperfectly understood, yet experience has tended to confirm the estimation in which this insect has long been held by medical men as a vesicating application. The certainty and safety of their operation have obtained for Cantharides the preference over all other vesicating substances; and we, therefore, find them forming the principle ingredient of the blistering applications in this country, on the continents of Europe and America, and among the Chinese. They present almost a solitary exception to the fate which has befallen the long list of animal substances, consisting of almost every conceivable part of almost every known animal, which figured in the early history of our Pharmacopœias. The blistering fly, may now, therefore be considered as fully established in our Materia Medica. Its employment as a medical agent is derived from great antiquity, but it has been doubted whether the ancients were acquainted with its external application as a blister. Hippocrates recommends the removal of the head, feet, and wings; but Galen, on the contrary, contends that the whole insect should be used. Dioscorides and Avicenna adopt the latter opinion, remarking, that the parts rejected by Hippocrates serve as an antidote to the venom of the insect. These opinions are probably entitled to but little consideration; excepting, inasmuch, as they show the attempts made at that early period to investigate the properties of this substance, and as it is still held in equal, if not greater, estimation as a remedy, the time we may devote in pursuing the examination of its active constituents will not, it is presumed, be uselessly

or unprofitably spent. The advantage which our continental neighbors are, by some, considered to have gained over us, in the preparation of blistering applications, should also be a stimulus to increased energy in this investigation. The vesicating taffetas of the French certainly appear to have advantages over our greasy and offensive blistering plaster; and the question may fairly be raised, whether this latter might not give place to an equally certain, efficacious, and inexpensive, but more cleanly and elegant application. The blistering tissues introduced in this country by Messrs. Smith of Edinburgh, and Mr. Butler, of St. Paul's Churchyard, possess all the requisites of elegance and cleanliness that could be desired, but a proprietary nostrum must necessarily be limited in its usefulness, from the want of confidence attaching to any remedy, the composition and preparation of which is not known. In the *Journal de Pharmacie*, for 1837, is a report by Cap and Soubeiran, to the Society of Pharmacy of Paris, on vesicating taffetas, which gives some insight into the mode of preparing those applications. The process recommended for their preparation, is that adopted by Messrs. Henry and Guibourt, which consists in liquifying, with double its weight of wax, the green oil that is obtained from Cantharides by means of ether. The mixture is spread upon a sheet of waxed linen or paper, in the same manner as common adhesive plaster. Other processes are described in which euphoribum is employed, but the operation of these is stated to be accompanied with more pain, and the effect to be less readily healed. An objection has been found to apply to the above process of Messrs. Henry and Guibourt, which is, that the concrete Oil of Cantharides loses its efficacy by long exposure to the atmosphere. Vesicating tissue paper, which I prepared in this manner, although it acted perfectly well when recently made, lost its blistering effect, after being exposed to the air for a few weeks. I observe in the formula of M. Dechamps, and also in that of M. Thierry, that a tincture of benzoin, or of balsam of tolu, is ordered to be laid over the surface of their taffetas, the object of which no doubt is, by forming a

varnish, to preserve the Cantharidin from the action of the atmosphere. I have not had an opportunity of ascertaining how far this would prove an effectual preservative.

But, in order to determine the best form for the application of Cantharides, it is necessary to be acquainted with their constitution. As early as the year 1803, their examination was undertaken by the French chemists, and in the *Ann. de Chimie* of that year, Permentier gives an account of Dr. Thouvenel's analysis of Cantharides, by treating them successively with water, alcohol, and ether. In this way he obtained,

Three-eighths of their weight, of yellow extractive matter, obtained by water. This was very bitter, and yielded an acid liquor by distillation.

One-tenth ditto, of concrete green oil, subsequently obtained by spirit, with the smell of Cantharides, and yielding a sharp acid and thick oil on distillation.

One-fiftieth ditto of a yellow concrete oil, subsequently obtained by ether, and analogous to the preceding.

One-half ditto, of insoluble parenchyma.

Thouvenel concluded that the vesicating qualities resided in the green concrete oil, and that the action on the urinary organs was due to one of the acids obtained by distillation. Permentier observes in this paper, that Cantharides produce a more energetic effect when applied in coarse powder, than when finely levigated. Dr. Pereira states, that

"The active and odorous principles of Cantharides reside principally in the sexual organs of the animals. Both Farines and Zier tell us, that the soft contain more active matter than the hard parts. It appears also that the posterior is much more acrid than the anterior portion of the body, and Zier says, the ovaries are particularly rich in this active matter. If so, it is evident that we ought to prefer large female to male insects. It is a well known fact that the odour of these animals becomes much more powerful at the season of copulation than at any other periods, and that persons sitting under

the trees, in which these insects are, at this season more particularly, are very apt to be attacked with ophthalmia and ardor urinæ.”*

In the *Ann. de Chimie* of the year 1804, Deyeux, has communicated the result of Beaupoil’s examination of Cantharides; which differs in some respects from that of Thouvenel. Beaupoil found that the aqueous decoction of Cantharides, when mixed with alcohol or with ether, separates into two parts, nearly equal; the one in the form of a black glutinous precipitate, insoluble in alcohol, and the other a yellow-brown matter which alcohol takes up very readily. He found that both these products, when applied to the skin, produced blistering in nearly the same time; and that the green concrete oil, to which Thouvenel ascribed all the blistering property of the fly, took no effect when applied alone, but caused blistering when mixed with wax.

These discrepancies remained unexplained until the year 1810, when Robiquet made known the details of his more accurate and satisfactory analysis of Cantharides. His experiments bear so forcibly upon the principles under consideration, that they appear entitled to a more detailed account than is met with in those elementary works which allude to them.

Adopting the same means of extraction, by water, alcohol, and ether, as the preceding experimenters, Robiquet proceeded as follows: Cantharides, in powder, were boiled with repeated portions of distilled water until nothing further was yielded to the liquid. The residue of the flies, was next treated with alcohol, and the tincture thus formed, on evaporation, afforded a green oil similar to that obtained by Thouvenel and Beaupoil. This oil was found to possess no vesicating properties. The decoction was now carefully evaporated to the consistence of a soft extract. It possessed the vesicating quality of the fly in a powerful degree. Boiling alcohol added to this took up a yellow matter and left a black glutinous residue. This

* *Materia Medica*, Part II., page 1368.

process was repeated with fresh boiling alcohol, and agitation as long as any color was afforded to the alcohol. The black residue was now found to be entirely destitute of vesicating power, while the alcoholic tincture possessed it in an eminent degree. The alcoholic extract was evaporated to dryness, and rectified ether added to the residue in a closed flask. After having been macerated some hours, with occasional agitation, a light yellow tincture was obtained, which, allowed to evaporate spontaneously, afforded small crystalline micaceous plates. The yellow matter in which these crystals were formed, was removed by cold alcohol, and the crystals dried between folds of blotting paper. The yellow matter removed by the alcohol was found to be inert, but the crystals possessed powerful blistering properties. The 1-100th part of a grain, placed on a slip of paper and applied to the edge of the lower lip, occasioned small blisters in about fifteen minutes. Some pommade being applied, served only to extend the action over a wider surface. Some atoms of the crystals dissolved in two or three drops of almond oil were rubbed over a small piece of paper and applied to the arm: in six hours a blister was formed the size of the paper. These crystals were insoluble in water, and in cold alcohol, but soluble in boiling alcohol, being again deposited in crystals, as the alcohol cooled. They were soluble also in ether, and very soluble in oils. The name of Cantharidin has been given by Dr. T. Thomson to this crystalline substance, which imparts the peculiar value to Cantharides.

Robiquet explains the difference between the result of his experiments and those which had previously been performed, by referring to the facts, that Thouvenel in treating the flies with water, had merely made an infusion of them, by which means the Cantharidin had not been extracted by the water, but was afterwards obtained with the green concrete oil, in the alcoholic tincture; but that Beaupoil, on the other hand, caused the flies to be boiled in the water, although not so as to remove the whole of their acrid principle, and he therefore had a portion of the Cantharidin in each of his products.

He also remarks, that although Cantharidin in its isolated state is insoluble in water, and in cold alcohol, yet it is taken up by both these liquids, when associated with other constituents of Cantharides, as the green concrete oil, or the yellow matter.

The latter portion of Robiquet's paper is devoted to an account of his investigations, with the view of determining the character of the free acid which is always found in infusions of Cantharides. It is worthy of particular observation, that he discovered in recently collected Cantharides a considerable portion of uric acid, but was unable to obtain the same result from those which had been kept some time. On the other hand, the latter were strongly impregnated with acetic acid. Referring to the fact of his not being able to discover uric acid in old Cantharides, he states, "and if I had not obtained it frequently from the fresh Cantharides, I should regard the result as doubtful." He also remarks, "it is curious to observe that these insects, which exercise so marked an action upon the urinary organs, present, in their composition, several points of analogy with urine."

Thierry's process for procuring Cantharidin is, to macerate the bruised fly in ether for several days ; to obtain the whole of the etherial essence by displacement ; to distil off the ether, and to treat the residue with boiling alcohol, and animal charcoal. The Cantharidin is thus obtained pure, in crystals. 1000 parts of Cantharides yield four parts of pure Cantharidin.

It may also be obtained by treating the flies with alcohol instead of ether.

Cantharidin possesses neither acid nor alkaline properties. According to Gmelin, it may be considered a solid volatile oil. It is fusible at a moderate heat, forming a yellow oil, which by a stronger heat is dissipated in white vapors, and again condenses into acicular crystals. In Dr. Pereira's account of Cantharidin, it is stated to be soluble in concentrated boiling sulphuric acid, forming a brown solution. It is also

soluble in boiling nitric and muriatic acids, without changing color, and is again deposited on cooling. It is dissolved by potash and soda; but when concentrated acetic acid is added to the solution, the Cantharidin is precipitated. Ammonia is without action on it. According to Regnaud, it consists of carbon, 61.68 ; hydrogen, 6.04, and oxygen, 32.28.

Thus we have the active principle of Cantharides eliminated from those inert or useless matters, with which it is associated in its natural state ; the character and properties of this principle, Cantharidin, are described ; and the best means are pointed out, for effecting its solution, whether it be in an isolated or combined form. Upon these data may, perhaps, be founded improvements in the preparation of our vesicating applications. Having alluded to objections which attach to some of the preparations in use, it has been my object to adduce the result of such investigations, as far as they have hitherto been carried, as may tend to elucidate the subject, by explaining the cause of those imperfections that are met with, and suggesting the means for their remedy.

The Chairman inquired whether the pain which usually accompanies a blister, is essential to its efficacy ; he had heard it stated by a physician, that this was the case.*

Mr. Ure remarked that the pain and irritation were merely symptoms of vesicating action. In acute cases it is often necessary to produce immediate vesication, and then boiling water or essential oil of mustard would be most effectual. In more chronic cases, the slow and regular action of a blister is preferable.

* The following is Dr. Pereira's statement : " It was formerly supposed that the efficacy of blisters was in proportion to the quantity of fluid discharged. But the truth is, that the therapeutic influence is in proportion to the local irritation, and has no more relation to the quantity of fluid discharged, than that the latter is frequently (not invariably) in the ratio of the former. Stroll's axiom is therefore correct, *Non suppuration sed stimulus prodest.*"—*Materia Medica*, Part II., page 1372.

Mr. Samwell observed, that the effects of a blister are very much modified by the natural texture of the skin, and that some persons are much less irritated by these applications than others.—*Lond. Pharmaceutical Trans.* Oct. 1, 1841.

ART. LIX.—MR. LISTON'S ISINGLASS PLASTER.

BY JACOB BELL.

MR. LISTON has for many years been in the habit of using, after operations and for other surgical purposes, a plaster consisting of oiled silk covered with a coating of isinglass. This plaster is mentioned in his well known work on Practical Surgery.*

The following is the method of preparing it. Moisten an ounce of isinglass with two ounces of water, and allow it to stand for an hour or two until quite soft; then add three ounces and a half of rectified spirit, previously mixed with one ounce and a half of water. Plunge the vessel in a saucepan of boiling water, and the solution will be complete in a few minutes.

Having stretched the oil silk on a board, by nailing it round the edges, apply the solution of isinglass with a brush taking care to move the brush evenly and in the same direction, making it smooth as you proceed—as in varnishing a picture. When quite hard and dry apply another layer, in the same manner, but moving the brush in the opposite direction, in one case horizontally in the other perpendicularly. In this manner apply four coats of the solution, or even a fifth, if the surface be not entirely smooth. The last layer should be reduced in strength by the addition of a little more

*Third Edition, p. 35.

water and spirit. An ounce of isinglass is sufficient for about a square yard of the plaster.

The following precautions should be observed:—the distance between the nails should not be more than an inch and a half, otherwise the oil silk will shrink in festoons and will not remain flat. The isinglass must be well soaked in water before the spirit is added, otherwise it will not make a complete solution; and the spirit, when added, must be diluted with a portion of the water, to prevent precipitation of the isinglass. The brush must be a flat "hog tool," such as is used for spirit varnish, and well made, otherwise the hairs will be found to come out, and this is an inconvenience, as the operation must be performed quickly while the solution is warm. The solution, when cold, should be of the consistence of blancmange.

Repeated experiments have shown that gelatine does not answer the purpose as a substitute for isinglass, either alone or in any proportions. A sample is on the table, in which the first three layers were composed of a mixture of the two substances, and the last is pure isinglass; in another sample only isinglass was used, and it will be seen that the latter is much more adhesive.

The oil silk has been, in a great measure, superseded by the use of a membrane, consisting of the peritoneal covering of the *cæcum* of the ox, rubbed down and carefully polished in the manner in which the common goldbeater's skin is prepared. The following is the report of this plaster, furnished by Mr. Ancrum, Mr. Liston's Assistant at the North London Hospital.

"From the extreme thinness of the plaster, the wounds can be examined without its removal. It adheres much better than plaster made with isinglass spread on silk; and in the first instance of its application becomes firmly fixed. It is difficult to fix the isinglass plaster spread on silk, unless it is very good. From the extreme tenuity of the membrane plaster, it is equally unirritating with goldbeater's skin; and

when once applied it remains so accurately adherent, that it does not require to be changed for many days. Altogether, after a good deal of experience in all the different plasters, we find it the best uniting material that has ever been produced."

In applying the isinglass to the membrane plaster, the directions already mentioned, with reference to the oil silk, may be observed, but a layer of drying oil is spread on the other side of the membrane.—*Ibid.*

ART. LX.—THE APOTHECARIES' COMPANY V.
GREENOUGH.

WE would gladly avoid any allusion to a subject which is calculated to give rise to party controversy, but the remarks which have appeared in other periodicals on the decision in the above case, oblige us to advert to it.

We cannot consider the case of Mr. Greenough at all applicable to Chemists and Druggists in general, and consequently the Pharmaceutical Society could not interfere in it in any way. When applied to by the defendant for protection some months back, the Council decided, in accordance with the opinion of their solicitor, that they could not render him any assistance, as he had been in the habit of acting professedly as a surgeon, *designating himself as such* in his bills, and charging for attendance as a medical practitioner. It appeared on evidence at the trial that he had even boasted of having 300 patients on his books. By this course they consider that he had exceeded the legitimate functions of a chemist and druggist, and had, in fact made himself ineligible as a member of the Pharmaceutical Society.

Had the case been one in which a chemist had casually, on an emergency, or as an act of humanity, visited a patient, we

are confident that (even if an action had been brought, which is very unlikely,) a different verdict would have been returned.

We, therefore, think the case of Mr. Greenough cannot be considered a precedent which affects materially, if at all, the interests of chemists and druggists in general.

The Editor of the *Lancet* expresses the opinion "that 'i was the intention of the Legislature, when the act (of 1815) was passed, that the new statute should not in any way affect chemists and druggists, either in prescribing or otherwise;" and the law having been thus interpreted from that time to the present, we consider that its authority is in no degree impaired by the verdict of a jury in a case of no ordinary intricacy, which is not applicable to chemists in general.

But seeing that druggists have this latitude conceded to them, it is incumbent upon them to be especially circumspect in the exercise of the power they possess. Those who avail themselves of a discretionary privilege to the utmost possible extent in violation of the dictates of propriety, bring discredit and injury on the body to which they belong, and afford a pretext for the imposition of restrictions. By acting with becoming moderation and prudence, and proving that we are worthy of the confidence implied in the privileges granted to us, we shall most effectually serve our own interest and disarm the power of extraneous opposition.

The question is not—Whether druggists ought to be invested with all the authority of Medical Practitioners? This we never pretended to claim, as it would nullify the fundamental laws which regulate the profession. The definition of the term chemist and druggist in the by-laws of the Society, is "a person who has been regularly apprenticed to, or educated by a vender of drugs or dispenser of medicines, and who does not profess to act as a visiting Apothecary or Surgeon." In this definition, medical practice is alluded to, merely for the purpose of distinguishing the chemist and druggist from the Apothecary. Yet it is necessary that druggists should be allowed to explain the nature and uses of the substances which

they sell ; and as it is impossible to define accurately the boundary between the performance of this duty, and giving advice in simple cases, the discretionary power which they have always possessed is proper and even necessary.

The Editor of the *Medical Gazette* observes, in reference to this subject, " It is plain from the present course of events, that the chemists will not be restrained within those limits of their business which do not involve an infringement of the Apothecaries' Act : they cannot be so restrained, nor, if they could, do we think it altogether prudent that they should, if they will only consent to submit to some fair test in proof of their fitness to be legalized for higher functions."

We are anxious to discourage the extensive practice of medicine by druggists ; but we contend, and have always contended, that severe legal restrictions would be attended with injustice, and would also be injurious to the public. Moreover, we repeat that such restrictions could not be enforced. The law against " counter practice" in France, is particularly strict ; yet we know that it is constantly evaded, and is therefore inoperative. While we endeavor to inculcate a sense of honor and prudence among our brethren, which shall prevent their exceeding the proper limits, we shall continue unflinchingly to advocate the continuance of *all* their existing privileges.

The question comes to this—Should it be lawful for any member of the community to swallow a dose of medicine without medical advice ? If this be allowed, from whom are the public to obtain information as to the doses and properties of the medicine ?—Undoubtedly, from the druggist of whom they procure it.

But, according to the definition of the term " practicing medicine," this term is held to mean " recommending or administering a remedy for any ailment or disorder of the body or mind, or any part thereof;" and if this act is to be visited with a penalty, *the druggist would be liable to fine and imprisonment every hour of the day, for giving that information to his customers, without which it would, in many*

cases, be unsafe to entrust them with the medicine which they are permitted by law to purchase.

The Editor of the *Lancet*, in alluding to "that frightful evil called 'counter practice,'" states, that it has "doubtless been attended with a dreadful sacrifice of human life." We cannot pass unnoticed a statement of this kind, which is a serious charge against the body with which we are connected, and we think the author of it should have informed us how many cases of death from "counter practice" have come before him during the time that he has officiated as coroner for the county of Middlesex.

In conclusion, if every druggist in the kingdom would read the leading article in the *Lancet* of September 11th, all doubt of the *necessity* of the Pharmaceutical Society would be removed. The leading article in the *Medical Gazette*, of the same date, is no less conclusive on this point, although the Editor takes a different view of the case from his "contemporary."—*Ibid.*

ART. LXI.—ACADEMY OF MEDICINE OF PARIS. REPORTS
ON POISONING BY ARSENIOUS ACID.

(*Extract.*)

Meeting of February 16th, 1841. M. Caventou, on behalf of M. Chevallier and himself, reported—1. On a medico-legal experiment relative to a case of poisoning by arsenious acid, made by Mott, Fan, and Bergés, before the court of Assize of Arriege.

2. A second report in the name of M. Pelletier and himself, upon an analogous case by MM. Girardin and Morin.

The conclusions from these reports are conformable to the results and experiments of Orfila, on the same subject; the reporters suggest the publication of the papers in the bulletin, and propose a vote of thanks to the authors.
(Adopted.)

M. Orfila rose, not to oppose these reports, but to thank the committee for the attention which they had bestowed upon an experiment which went to prove, that in proceeding in the mode which he had prescribed, there could not be procured, from the viscera of individuals not poisoned by arsenic, any trace of that metal, although putrefaction was fully established. His assertions on this point had been so positive that he had been several times surprised to read and hear repeated that he had developed arsenic from bodies in a state of putrefaction. He wished also, to call the attention of the Academy to a certain number of facts already partly published, and which would appear to invalidate many of the results announced to the Academy. In fact MM. Flandin and Danger had read to the Institute, a memoir of which the principle conclusions are: 1. That arsenic does not exist in the human body in its natural state. 2. That the earth of cemeteries does not contain it—at least that they were not able to detect it in that of Mount Parnassus and Pere-Lachaise. 3. That by means of

Marsh's apparatus and substances not containing arsenic, they could obtain spots similar to those from arsenic, and affording all the reactions of arsenious acid. Before examining these three propositions, M. Orfila stated it to be desirable, that the first two assertions should be cleared of all doubt—that thence would be avoided in future, the objections so frequently repeated by legal advisers, objections drawn from the fact of arsenic naturally existing in the human body, and the earth of cemeteries. This problem resolved, and which has for its object to demonstrate the presence of arsenic in all the viscera of persons thus poisoned, it can no longer suffer the least opposition on the part of the contraditors.

On the first point, M. Orfila expressed himself thus: *Arsenic cannot be obtained from the human body.* As far as the viscera are concerned, M. Danger and Flandin have only repeated what M. Orfila had already established. In addition, he also assumed that the bones do not contain it. Without any further explanation, M. Orfila stated, that on the third of November last, he had placed at the command of the Academy, a sealed note, which is in the hands of the perpetual secretary, and which contains his opinion on this point.

M. Orfila never said that the earths of cemeteries were all and constantly arsenical; the title of his third memoir would prove to what extent he reserved himself on this point—the title is: *On the earths of cemeteries—on the arsenic which they may furnish, and upon the medico-legal deductions which should be drawn from the possible existence of an arsenical composition in these earths.* M. Orfila reported in the same memoir, experiments made upon three specimens of earth taken from the cemetery of Villey-sur-Tisle, near Dijon, and he proved that only one of these afforded arsenic. The same fact was established with regard to the cemetery of Mount Parnassus, he having extracted arsenic from one portion and not from another. This diversity of result is perfectly explained, by calling to mind that these earths, when arsenical, contain this metal under the form of insoluble

arsenite of lime, which hence remains in the part where it was accidentally deposited, and is not dispersed throughout the neighboring parts. MM. Flandin and Danger might then have been unable to find arsenic in one portion of the soil, without being able to say that it does not exist in portions not examined by them.

Examining the question of the spots produced by MM. Flandin and Danger. According to these gentlemen, on introducing into Marsh's apparatus, while in operation, the sulphite and phosphite of ammonia, still more Dippel's animal oil or oil turpentine, spots may be procured similar to the arsenical deposits, and which afford all the reactions of arsenious acid. M. Orfila stated that he had prepared with 30 centigrammes of sulphite of ammonia, a like quantity of phosphite and 18 drops of oil of turpentine, spots, equal to those procured by MM. Flandin and Danger; and which he presents to the Academy, together with some produced by arsenic. The difference between these deposits are so striking that he can scarcely suppose it possible to mistake the one for the other. In fact the former are large, brown with a varied reflection of yellow, very brilliant; it is very easy to distinguish them with the naked eye, so little do they possess any similarity to the brown arsenical spots. They promptly redden moistened litmus paper, even when recent, while the arsenical spots, even when old do not change this paper, at least if not procured by a strong flame and a portion of sulphuric acid has not been projected from the apparatus. To perform this experiment, the moistened paper should be applied upon the spot and then pressed with a glass rod, and not with the finger, for this constantly reddens the test paper.

Strong nitric acid neither dissolves nor detaches entirely, *when cold*, the spots produced by MM. Flandin and Danger even when assisted by the action of a glass tube. At the boiling temperature, they slowly dissolve, and produce a yellow liquid. If this liquid be evaporated to dryness there remains a residue of yellow, bordering slightly on a brown

color, which may be deprived of color or at least brought to the state of a yellowish white residue, by repeated boilings with small proportions of strong nitric acid. This residue, cooled and touched with a drop of nitrate of silver, assumes a yellow similar to that of phosphate of silver, and *not a brick-red* color.

The arsenical spot, on the contrary, *immediately disappears* in *cold* nitric acid, and if the liquid be evaporated, arsenic acid remains, with which nitrate of silver will instantaneously produce a *brick-red* color.

A complete solution of the question, whether it is possible to obtain spots, such as are spoken of by MM. Flandin and Danger, by carbonizing the intestines of individuals not poisoned, and introducing an aqueous decoction of the residue into Marsh's apparatus? is to be found in the fact that if the carbonization be *complete*, and performed according to the rules laid down, then the sulphite and phosphite of ammonia which may exist in the organic matter is transformed into sulphate and phosphate of ammonia, which do not afford the slightest spot with the apparatus of Marsh. This result is so well known that it is useless to support it by new proofs.

But, it constantly happens that when the organs of a person poisoned are *completely* carbonized, if the organ had retained any of the poison, a greater or less number of arsenical spots may be obtained.

M. Orfila spoke concerning spots far more important than those noticed by MM. Flandin and Danger because they bear more resemblance in their physical character at least, to arsenical spots. He exhibited several plates upon which were found the spots obtained, whether with bichloride of mercury, with chloride of tin or of lead, or finally with sulphate or chloride of zinc. It is sufficient to introduce any of these into the apparatus of Marsh, acidulated either with sulphuric or hydro-chloric acid, and to act *with a strong flame*, to collect on a porcelain plate, brilliant, shining black spots, similar in color to arsenical deposits. These salts are carried up with the hydrogen gas, deposited on the plate and decomposed by

the same gas. He did not explain the nature of these spots, but affirmed that they could readily be distinguished from those of arsenic. 1. Because they are only partly volatile, and that with difficulty under a strong flame, at least when not exceedingly thin. 2. Because although cold nitric acid dissolves them rapidly, they never furnish on evaporation, a residue with which nitrate of silver will produce a brick-red color. Likewise, these spots cannot be obtained with a very small flame, although there may be much salt of zinc, lead, &c., in the apparatus, while the arsenical spots are produced readily with a feeble flame. MM. Thenard, Dumas, Regnault and Boussingault, have already obtained similar spots by sulphate of zinc.

There are other spots which are readily produced even with a *moderate* flame, by allowing this to fall upon plates formed of *certain* kinds of pipe clay; the oxides of lead and of tin which enter into the composition of the glazing applied to this kind of pottery, are reduced by the hydrogen, and there result spots either of a light or deep gray, and sometimes blackish, tarnished—slightly, or not at all volatile, and insoluble in nitric acid, either hot or cold. These spots cannot be confounded with those from arsenic.

In conclusion, these spots cannot be mistaken for arsenical spots, by any conversant with the subject.

A chemist, accustomed to these researches will not be in the least degree embarrassed in establishing the distinction between these spots.

A person of moderate ability, but attentive, will recognise, without difficulty, and solely by the character laid down, whether or not the spots are arsenical.

M. Chevallier added to what M. Orfila had stated concerning the spots upon plate or pipe clay, that there were some spots which were due to carbon; so that the plate used may afford spots not due to reduced lead, but resulting from the conversion into carbon, of substances which had penetrated the substance of the plate. He established that MM. Girardin and Morin had merited well of science by proving, in their

medical report, that the animal substances which they had examined do not contain arsenic. But he said that already in several judiciary reports he had proven the absence of this metal from the viscera of the human body. He besides stated, that in conjunction with M. Ribes, jr., Surgeon to the Invalids, he had made numerous experiments with the view of detecting arsenic in the blood, the existence of which Belge had announced, but the results were negative.

March 16th, 1841. M. Chevallier, on behalf of M. Caventou and himself, made a report upon a case of arsenical poisoning observed by M. Bouillet. He stated: 1. That the patient died although he took immediately *colcothar*, which was substituted for *the hydrated oxide of iron, prescribed by the physician*, and was followed by diuretic drinks. 2. That the patient discharged very little urine, but that the urine contained arsenious acid. Dr. Bouillet having stated that the urine discharged on the fifth day, contained more arsenic than that on the fourth; the reporters observed that the fact might be possible, but that nothing in the observation of Dr. Bouillet demonstrated the truth of the assertion. Finally, the reporters suggested that the thanks of the Academy be presented to the author.

M. Orfila addressed the Academy on the subject of the report in the following note:

I request permission to read to the Academy, some observations in regard to the fact communicated by Dr. Bouillet. My observations relate to the use of colcothar and hydrated peroxide of iron; and to the presence of arsenious acid in the urine of an individual poisoned by this substance.

Colcothar and Hydrated Peroxide of Iron. I purposely notice these two separately, because it is important not to confound them together. Colcothar is an anhydrous oxide which does not exercise any neutralizing power with arsenious acid; for, if we boil for two hours 16 grammes of this oxide with water, holding in solution 2 millegrammes (1.25 gr.) of arsenious acid, the filtered liquor will still afford arsenic by means of Marsh's apparatus; 16 grammes, then,

of this oxide have not neutralized even 2 millegrammes of arsenious acid, which is the same as saying that it requires more than 2000 grammes (12½ ounces) to absorb one grain of this poison. It is evident from this fact that colcothar should be rejected in the treatment of poisoning by arsenic. May the same be said of the hydrated peroxide? I do not think so, although I do not allow, that it is *completely* capable of neutralizing arsenious acid. Let us examine the facts of the case.

M. Guibourt proved, in a paper printed in 1839, that 100 grammes of hydrated peroxide of iron, in the state of *magma*, was sufficient to absorb and neutralize 3½ decigrammes (7 grs.) of arsenious acid. I have proven by numerous experiments, that if the hydrated peroxide, instead of being in the state of *magma*, be used dry, that is to say hydrated but not moist, and at the temperature of 36 or 40° C., 16 grammes will neutralize about 6 decigrammes (12 grs.) of arsenious acid. At least the aqueous liquor, resting over 16 grammes of the hydrated oxide, left for some hours in contact with 6 decigrammes of arsenious acid, did not become yellow on the addition of a solution of hydro-sulphuric acid, to which some drops of hydrochloric acid had been added.

On the other hand, the experiments of MM. Leseur, Bouley, jr., Nonat, Deville and Sandras, &c., have established that animals never die poisoned by arsenious acid, although sufficient to produce death has been administered, provided they have taken the hydrated peroxide in sufficient quantity to neutralize the whole of the arsenious acid. MM. Nonat, Deville and Sandras, have advised, and with reason, to use in preference the dry hydrated peroxide, because it contains in the same weight, four or more times the amount that it does in the state of *magma*; and they also advise to give 16 grammes of dry hydrated oxide for each grain of arsenious acid to be neutralized.

It is curious and useful to resolve the problem, as to what extent the compound of arsenic acid and hydrated peroxide of iron formed in the stomach of individuals poisoned, retains its

poisonous properties. MM. Nonat, Deville, and Sandras, have announced that this compound is poisonous. The experiments which I have performed leave no doubt on this point. I administered to robust dogs, of mean size, 32 grammes of dry hydrated peroxide of iron, which I had previously combined with 11 grammes (20 grs.) of arsenious acid; the ferruginous compound did not contain an atom of free arsenious acid; it could be boiled with water without yielding to that liquid the least trace of the poison. The animals who took this sub-arsenite, had more or less abundant alvine evacuations, and soon exhibited all the symptoms of poisoning by arsenic; they died in 28, 30 and 40 hours, provided vomiting was prevented, and, on examining the body, arsenic could be detected in the urine, and in the liver; the digestive tube was inflamed.

Arsenic acid reacts with coleothar and hydrated peroxide, precisely as the arsenious acid.

I conclude from the preceding facts :

1. That coleothar should never be employed as an antidote to arsenious or *arsenic* acid, because it does not neutralize these poisons, even in an exorbitant dose.
2. That dry hydrated peroxide of iron absorbs and neutralizes a large amount of these acids, forming sub-salts of iron, which are poisonous, but less deleterious than the acids themselves; the unfortunate results from these sub-salts evidently depends upon their decomposition by acids contained in the stomach, and the consequent absorption of the liberated arsenical acid.
3. It is consequently useful to administer this dry hydrated peroxide, previously suspended in water, especially if vomiting be produced; for then, independently of that part of the poison expelled in the state of the *arsenical acid* by vomiting, the patient will also reject the *sub-salt of iron*, which is formed in the stomach and which will contain a considerable portion of the arsenical acid.
4. That when vomiting is not produced we should but slightly fear the presence in the stomach of the sub-arsenical

salt, although somewhat poisonous, because as soon as these salts are decomposed by the acid of the stomach, the arsenical acid set free is seized and neutralized by another portion of the peroxide, which, as is constantly recommended, *should be administered in large amount*.

Let me add a few words upon the complications in medico-legal research, which may arise from the presence of hydrated peroxide of iron in the digestive organs. I announced last September, that certain colcothars and certain hydrated peroxides of iron of pharmacy, contained arsenic, and that it is sometimes sufficient to introduce only a few grammes into Marsh's apparatus, to obtain numerous arsenical spots. Suppose that, in a case of poisoning by an arsenical acid, the hydrated peroxide of iron had been administered, and being subsequently extracted from the stomach or intestines, was recognized as arsenical; how shall we determine whether the arsenic furnished, is derived from the peroxide of iron, naturally containing arsenic, or from the sub-salt of iron, resulting from the combination of the peroxide with an arsenical acid taken as a poison? This question, of incontestable importance, is easily resolved.

1. Every fact leads to the belief that, when poisoning results, the arsenical acid has not been entirely neutralized by the peroxide, with which it is perhaps mixed; if so, it will suffice to boil, for 25 or 30 minutes, the peroxide with distilled water, which will dissolve the *free* arsenical acid, while it will not exercise any action upon the arsenic naturally contained in the peroxide of iron, or upon the arsenite, or arseniate of iron which it may have formed.

2. Admitting that boiling water has not dissolved traces of arsenious or arsenic acid, then shake up 15 or 16 grammes of the peroxide of iron well washed, with as much alcoholic potassa in the *cold*; this alkali, which will not separate a single atom of the arsenic naturally contained in the peroxide, will combine with the arsenical acid which may have been neutralized by the peroxide, *in however small an amount the notable quantity of this acid may be* in the sub-salt of

iron. The arsenite of potassa dissolved in the water may be readily recognized, either by the apparatus of Marsh, or by the hydrosulphuric acid gas, after saturating the excess of alkali.

If in place of acting in the cold, we boil, for two hours, the above proportions of peroxide of iron and potassa, the filtered liquor will contain arsenic, whether we operate with certain peroxides naturally containing arsenic, or with those which have absorbed an arsenical acid in the digestive canal.

Presence of arsenic in the urine of individuals poisoned by an arsenical preparation. Since, latterly MM. Flandin and Danger, have doubted the existence of arsenic in the urine of certain animals, poisoned by arsenic, I judge proper to add to what I have already published on this point :

1. This metal has been found in the urine of dogs poisoned by the application of a decigramme of arsenious acid, applied through the subcutaneous tissue of the thigh, or by means of the stomach, from the administration of 60 or 75 decigrammes of arsenious acid in fine powder, although the animals had taken neither food or liquids for twenty-four hours; or finally by the introduction into the stomach of 20, 30 or 40 centigrammes of this poison dissolved in water.

2. That in fact, the urinary secretion is *sometimes suspended* in this poisoning, and that there exists but a few drops of urine in the bladder.

3. That it may likewise happen, when death takes place, at the end of a few hours, that the arsenious acid may not have as yet arrived at the bladder. I am so convinced of the truth of these assertions, that I willingly offer to demonstrate them to MM. Flandin and Danger. Of all the processes contrived to detect the presence of arsenic in the urine, that which in my opinion deserves the preference, consists in treating this liquid with nitrate of potassa, as I have previously pointed out in a former paper on arsenic. It was thus that M. Chevallier extracted arsenic from a very small quantity of urine voided by the patient, who was the subject of M. Bouillet's observation laid before the Academy.

M. Chevallier in answer to the remark of M. Orfila, stated his opinion to be : 1. That the hydrated peroxide of iron is an excellent antidote for arsenic, explaining the term, by saying, that previously we possessed no certain antidote for arsenious acid, whilst numerous facts collected in Belgium, Germany and in France, facts set forth in the excellent memoir of M. Tierrot, a pharmacist of Bourg (Ain,) and subsequently in several scientific journals, have made known all which may be derived from the use of this oxide. 2. That arsenic will not be met with in the oxide of iron, prepared by dissolving sulphate of iron, and passing through it hydro-sulphuric acid gas, set aside to deposit, then filtering, boiling, afterwards precipitating by an alkali, washing the precipitated oxide and preserving for use. 3. That the oxide of iron given even a long time after the poison, still acts, as has been demonstrated by the facts published in the medical journals.

M. Bally asked whether hydrated peroxide of iron acts as an antidote for arsenic acid. M. Chevallier thought that further experiment was necessary to reply affirmatively. Meanwhile he observed, that in horses, poisoned accidentally with arseniate of potassa, it was proven that those to which the hydrated peroxide was administered, died later than those which were not treated with this oxide.

Meeting of March 23. M. Bally having inquired at the last meeting whether the peroxide of iron was an antidote for arsenic acid as well as for arsenious acid—M. Orfila stated that, since the last meeting, he had made experiments, from which it results that the peroxide of iron acts upon arsenic in the same manner as upon arsenious acid. He likewise was desirous of knowing whether the poisonous action of arsenic acid was as intense as that of arsenious acid; in fact, he gave 20 decigrammes of arsenic acid to a large dog ; this dose was sufficient to produce death. He associated with the same dose of arsenic acid, an ounce of peroxide of iron ; this mixture was injected into the stomach of a dog, and the oesophagus immediately tied; the animal lived several days, although the former had died in a few hours.

ART. LXIII.—ON HIPPURIC ACID AND ITS TESTS.

BY ALEXANDER URE, M. D., A. M.

Read the 9th of June, 1841.

IN a paper communicated by me to the Medico-chirurgical Society in the month of January last, it was pointed out, for the first time, that when a certain portion of benzoic acid, or of a soluble benzoic salt, is introduced into the human stomach, a remarkable change takes place in its passage through the kidney. The urine voided in the course of a couple of hours after its ingestion, amounting usually to five or six ounces, will be found, upon adding a twelfth part of muriatic acid, to yield by and by a copious precipitate of beautiful rose-pink acicular crystals. These, when examined by the microscope, exhibit the form of a four-sided prism, terminated by a dehedral summit. Now this is precisely the crystalline character of an acid peculiar to the urine of the horse, cow, and other graminivorous animals, and to which, for that reason, Liebig has assigned the name of *hippuric*.

By this single interchange of elements, capable of being effected only by the aid of vital chemistry, we have an organic product, uric acid, containing eight atoms of azote and ten of carbon, replaced by one, hippuric acid, containing no less than eighteen of carbon and only two of azote! In pursuing the above investigation a step further, it was ascertained that no trace whatever of uric acid or any of its salts could be discovered in the urine in question. In point of fact it had been wholly superseded by the other acid.

The important circumstance connected with this research, as bearing upon medical practice, is that the salts which this new acid forms with the ordinary bases occurring in the animal fluids, as soda, ammonia, and potash, are all of easy solu-

bility. Thus hippurate of soda requires about two parts of water at 90° Fahr. to dissolve it, whereas the corresponding uric salt, which constitutes, as it is well known, the gouty concretions or chalk stones, is acknowledged to be nearly as insoluble as uric acid; it requires at least 4000 parts of water to dissolve one. Hippurate of ammonia again is but little less soluble than hippurate of soda, while urate of ammonia will only dissolve to the amount of 1-480th part. Hippurate of lime, the least soluble of these salts examined by me, requires 18 parts of water to dissolve one.

The application of the above principle has proved of material benefit in the treatment of certain unhealthy conditions of the urine, occurring in subjects of a calculous or gouty diathesis ; since it enables the practitioner to obviate entirely the various depositions resulting from excess of uric acid, the fruitful source of that most distressing malady, stone in the bladder ; as also to controul and prevent the formation of the so called tophaceous concretions or chalk stones, which occasion so much inconvenience, deformity, and pain to individuals laboring under gout.

By judicious exhibition of the benzoic acid, or, according to particular circumstances of a benzoic salt, that is to say apportioning the dose to the state of the renal secretion, best previously ascertained by analysis, we can fulfil the desired indication with unerring precision, and that, as shown in the above paper, without any risk of affecting the general health, or of irritating the urinary organs.

It is to be kept in mind that this plan of treatment by no means precludes the adoption of other suitable remedial measures. Of course certain rules of diet must be observed, which there is no necessity for referring to here. It would be equally irrelevant to occupy your time with the details of cases, several of which have lately come under my notice, and go to corroborate the statements above made.

As benzoic acid is apt to irritate the fauces, unless administered in a liquid state, and as it needs a large quantity of water

to dissolve it, it will be found expedient to give it along with phosphate of baborat of soda ; since they enhance its solubility without abating its specific power. Thus, four parts, by weight, of the former, or one part and a half of the latter salt, will enable a comparatively small proportion of distilled water to take up one of the acid. This difficulty, as is obvious, does not apply to the benzoate of ammonia or of potash.

Phosphate of soda not only serves to hold benzoic acid, but likewise hippuric acid, in solution; and this is a point of some consequence, seeing that any excess of the latter acid, accidentally present in the urine, will remain dissolved by means of the neutral phosphate of soda, or the triple phosphate of soda and ammonia (microcosmic salt) naturally existing in that secretion. These phosphates, however, produce a very different effect upon the uric acid, inasmuch as they promptly convert it into urate of soda, by depriving the salt of one half of its base, and thereby transforming it into bi-phosphate. This fact, which recently presented itself to me in the course of some experiments, and which has not been heretofore noticed by any chemical authority, seems to furnish a simple and rational explanation of the mode of formation of urate of soda, the basis of chalk-stones. Hence, whenever the oxidizing process of the kidney is proceeding with such energy as to supply a superabundance of soluble phosphates on the one hand, and of uric acid on the other, there must inevitably result an excess of urate of soda.

Having premised the above observations with the mere view of pointing out what appears to cast some new light upon the importance of benzoic acid and its compounds, as therapeutical agents in virtue of their power of generating hippuric acid, it has appeared to me proper to indicate the distinguishing features of these two acids, as some objections have been started touching the difficulty of discriminating the one from the other. For convenience sake the leading peculiarities have been arranged in collateral order, as follows :

BENZOIC ACID.

Crystallizes in hexagonal needles, or in white, diaphanous, pearly, flexible laminæ.

Is soluble in two parts of ether.

Is not changed by dilute nitric acid.

Heated with three times its weight of hydrate of lime, generates simply benzole.

BENZOATE OF AMMONIA.

On being exposed to a strong heat, melts and flies off in benzoic acid fumes, without leaving any appreciable residuum.

BENZOATE OF POTASH.

Burns without emitting any particular aromatic odor.

On the whole sulphuric ether furnishes the readiest test for distinguishing these two acids, from the easy solubility of the one, and the difficult solubility of the other in that menstruum.

Pharmaceutical Transactions.

HIPPURIC ACID.*

Crystallizes in four-sided prisms with dehedral summits.

Is very sparingly soluble in ether.

Treated with dilute nitric acid, and evaporated to dryness, produces, on the addition of ammonia, a beautiful purple color.

Heated with three times its weight of hydrate of lime disengages a quantity of ammonia.

HIPPURATE OF AMMONIA.

Exposed to heat, melts and assumes a rose-red color forming a reddish acid ; which being dissolved in water and evaporated, affords red crystals, resembling hippuric acid in their properties.

HIPPURATE OF POTASH

Heated so as to undergo decomposition, exhales the odor of bitter almonds.

*The verifications were all made with hippuric acid derived from the human subject.

ART. LXIV.—ANTIDOTE TO THE SALTS OF COPPER. By
W. BENOIST, Pharmacist at Sancoius, (Chev.)

Liquid albumen is at present almost exclusively adopted as an antidote for the salts of copper, since it possesses the property of decomposing and precipitating almost all the metals, and of forming albuminous compounds with the metallic oxide and the acid. But we are exposed to serious consequences in poisoning, if after having excited and facilitated emesis, we should administer to the patient a large amount of albumen, for the purpose of more certainly neutralizing the poison; what happens? The cupreous precipitate will be dissolved in the excess of albumen. If on the contrary, too small a quantity of this latter is employed, it will remain dissolved in the excess of solution of copper. To obviate this inconvenience, we have no means, for we do not know what amount of albumen is necessary to neutralize a given quantity of any salt of copper; and were this positively known, we could not properly estimate the quantity remaining in the stomach after emesis.

I am about to propose another agent which does not offer the same inconvenience; I mean, a solution of carbonate of soda, which forms with the salts of copper precipitates of a green color, insoluble in water, carbonate of copper. It is on account of its insolubility in water, that this carbonate has no action on the animal economy. I have experimented on animals; some I caused to take acetate of copper, others the sulphate, and to others I gave at the same time both the salt of copper and the alkaline solution. In every case the results were satisfactory. I caused a dog of moderate size to take 35 grains of saturated solution of carbonate of soda. This quantity, more than sufficient to neutralize the poison, did not produce any unpleasant effects. I judge that this salt may be exhibited with impunity, in large amounts, as in the above cited case it only produced some alvine evacuations. The

large quantity of carbonic acid which it contains (in 100 parts, carbonic acid 45, soda 31, water 29,) causes it to be less caustic, than the other alkaline carbonates. I have not yet had occasion to employ this in any case of poisoning in the human subject. I may observe that we ought not to lose sight of the indispensable necessity of exciting vomiting, so as to expel as much as possible the excess of poison.

Before M. Orfila had elevated toxicological science to its present rank, we may call to mind what were the means used to counteract the effects of the preparations of which I have spoken: solutions of sugar; these means being effectual how can we explain the result? It may be that the carbon of the sugar coming in contact with the oxygen of the water and of the oxide of copper, passes to the state of carbonic acid, and then the same reaction is produced as by the means I have recommended.

We have a recent example of the effect of sugar in an observation of M. Lesage, relative to a young man, who, wishing to destroy himself, took the sulphate of copper in a highly sweetened drink, and by accident escaped, the poison being thus neutralized.

From the foregoing, we may conclude that if sugar by one of its elements, may give rise to the formation of carbonic acid, and form insoluble compounds with the salts of copper, we should not be astonished that the bicarbonate of soda should possess this property in a higher degree.

Milk has also been for a long time considered an antidote to the salts of copper; the acid, it is true, separates the curd which precipitates; but it does not really render much service under these circumstances, unless it acts as a soothing application.

Jour. de Chimie Med.

ART. LXV.—NEW PROCESS FOR THE DETECTION OF
COPPER, APPLICABLE TO MEDICO-LEGAL ANALYSIS.
BY M. VERGUIN, of Lyons.

THIS process was suggested by an observation made some years since in analysing a mineral of copper. By accident, I placed the solution in a platinum capsule, and wishing to estimate the copper in the metallic state, placed therein a plate of iron. While the iron was not in contact with the platinum, no action took place; but the instant it came in contact with this latter, the capsule was covered with a very adherent film of copper, no precipitation taking place on the iron. The adhesion was so strong, that to separate them, nitric acid had to be used. I paid but little attention to this fact, and had almost forgotten it, when it was called to mind by reading the process of Dr. Christison, for the detection of mercury; and I sought out a simple process which might be applied to the determination of copper in medico-legal analysis. It is this which is the subject of the present note.

Before entering on the description of my process, I will rapidly examine the different reagents employed—their degree of certainty, and the case in which they will be insufficient. These reagents are ammonia, the yellow cyanide of potassium and iron, and metallic iron.

Ammonia acts by dissolving the oxide of copper, and producing a fine blue color; this color is with difficulty perceived, if—1st, the liquid tested contains a salt of which the base is precipitated by the ammonia, for then it is disguised by the precipitate. 2d, if it is colored by organic matter. It is true we may filter, and decolorise by animal charcoal—but when but little of the substance is possessed, it is very important not to lose any by the number of manipulations.

The cyanide of potassium and iron detects minute quantities of copper; for this it is necessary that the liquid should be pure, and especially that it should not contain a trace of iron,

for without this it is impossible to distinguish the brown color of the salt of copper, when mixed with the blue of the salt of iron.

Iron acts by decomposing the salt of copper and precipitates the copper in a metallic state, an action well represented by the following formula: $(\text{CuS}) + \text{Fe} = \text{Cu} + (\text{FeS})$, where we may see that the iron takes the place of the copper, and when the reaction terminates, we have sulphate of iron and metallic copper. But it is necessary that the liquid should be acidulated by a little acid; but if too much be added and the copper be in small amount, the iron blackens, and prevents the copper being readily distinguished. Moreover, the copper does not adhere, and the least disturbance causes it to separate.

These uncertainties do not exist in the process which I am about to describe, and which is no more than the application of the observation of which I spoke in the commencement.

It is proper that the liquid to be examined, if it be dilute, should be somewhat concentrated, and slightly acidulated with hydrochloric acid; a drop is to be placed on a plate of platinum, and covered with a well polished plate of iron, in such a manner that the iron shall touch both the liquid and platinum. In a few seconds the platinum exhibits a very adherent covering of copper throughout every part touched by the liquid. The explanation of this fact depends entirely upon electro-chemical theory; it results from principles which I shall rapidly enumerate: 1st, when two metals are placed in contact, there is a production of electricity, one of the metals being positively and the other negatively electrified. 2d, when a solution is subjected to the action of the pile, the salt is decomposed, the acid passing to the positive, and the base to the negative pole. There are some salts which are not only thus decomposed into acid and base, but still further the base itself is decomposed into metal and oxygen; in this case, the metal only passes to the negative pole, the oxygen appearing at the positive pole.

But, when iron and platinum are placed in contact, there is a developement of electricity, which developement is the more active when a saline solution is present; the iron becomes

positive, the platinum negative. The salts of copper have the property of being decomposed not only into acid and base, but into oxygen and metal. Hence the acid being more oxygenated is transferred to the iron or positive pole, while the metal is fixed on the platinum or negative pole.

Such is the process which I offer as most exact, and not liable to the uncertainties of the other methods. It is simple, does not require any manipulation which may not be performed by persons with but a slight chemical knowledge, and I believe will be found useful in medico-legal experiments.

Jour. de Pharm.

MISCELLANY.

On the preparation of Chloride of Potassa. By Professor GRAHAM.—It is well known that the ordinary processes for this important salt are attended with some practical difficulties. When a stream of chlorine gas is passed through a strong solution of carbonate of potassa, the absorption of the gas is rapid and complete, till one half of the alkaline carbonate is decomposed; but the remaining portion, which is in a state of bicarbonate, is not so easily acted upon. To decompose the latter salt completely, chlorine must be applied in excess, and the decomposition is attended by the formation of free hypochlorous acid, as has been proved by M. Detmer. The liquid is also at the end highly bleaching, and contains much hypochlorite of potassa. The boiling necessary to convert the latter into chlorate of potassa and chloride of potassium, occasions, according to M. Morin, a considerable loss of oxygen, and thus lessens the product of the chlorate. When a strong solution of caustic potassa is substituted in this process for the carbonate, the absorption of chlorine proceeds without interruption; but the liquid, when saturated, bleaches strongly from hypochlorite formed. A long-continued boiling is required to destroy this property completely, and as oxygen escapes, the chlorate obtained must be deficient in quantity in a correspondent proportion. The process which the author recommends, and which is attended by none of these inconveniences, consists in mixing carbonate of potassa intimately with an equivalent quantity of dry hydrate of lime, and exposing the mixture to chlorine gas. This mixture, although quite dry, absorbs the gas with prodigious energy; the temperature rises much above 212° , and water is freely evolved. When saturated, it may be moderately heated, which destroys a mere trace of hypochlorite it contains. The whole lime is found in the state of carbonate, and the potassa in the state of chlorate of potassa and chloride of potassium. The solution of the two latter salts is neutral, without any bleaching property, and free from lime. The chlorate of potassa may be crystallized from it in the usual way. Carbonate of potassa, when moistened and exposed to chlorine, without the hydrate of lime, absorbs the gas with great avidity, and certainly answers better than a strong solution of the same salts; but the absorption becomes slow after the salt is in the state of bicarbonate, and subsequently a large

quantity of the bleaching hypochlorite of potassa is produced. In the new process described above, there is no reason to believe that the carbonate of potassa is decomposed by the dry hydrate of lime till the chlorine is presented to the mixture; then, while the lime attracts the carbonic acid, the chlorine acts simultaneously upon the potassa, and the carbonate of potassa is thus readily decomposed. The same principle of calling in a secondary agency to promote combination, may be taken advantage of in many other cases. Thus hydrate of lime, dry or slightly damped, ceases to absorb sulphuretted hydrogen long before it is saturated with that gas; but, if mixed with an equivalent of hydrated sulphate of soda, the absorption takes place with greatly increased avidity, and goes on until two equivalents of sulphuretted hydrogen are taken up for one equivalent of lime. But here, with the assistance of sulphuretted hydrogen, the hydrate of lime decomposes the sulphate of soda, sulphate of lime being formed, while caustic soda combines with the sulphuretted hydrogen.

Lond., Edin. and Dub. Phil. Mag.

Action of Acids on Sulphate of Iron. By M. CALLOND, (d'Ancey.)—I have made an observation which appears to me to be new, which, by the advice of my colleagues, I make known to chemists, to examine more particularly the phenomena, and produce, if possible, an explanation.

The proto-sulphate of iron, placed in contact in the cold with strong sulphuric acid, assumes a more or less intensely red colour. I have observed that on adding a small quantity of water, and agitating slightly, so as to disturb the red colour, this presents the fine appearance of the vapour of iodine.

Sulphuric acid, which does not produce this effect, either from its want of strength or from the presence of organic matter, may be caused to acquire this remarkable property by being boiled with a few drops of nitric acid for a length of time sufficient to drive off the nitric oxide formed.

If the sulphuric acid produces the new character with the salt in only an insensible or slight degree, one drop of nitric acid will develope it rapidly; and when the glass is long and narrow, a variety of violet red zones will be observed. That portion which is not in contact offers no colour. When mixed the whole colour disappears. When water is added to the most intensely red product, the colour likewise disappears.

I do not believe that this is in consequence of oxidation. On the first contact with the acid, the surface of the salt shoots out small crystals and becomes white, probably passing to the anhydrous state. If the sulphate becomes oxidized, the liquid presents more or less of a red colour.

Nitric acids alone does not produce upon the salts any variation but what is known.—*Jour. de Chim. Med.*

Arsenic in Muriatic Acid.—At the session of the Academy of Science on the 20th of September, Prof. Dupasquier, of the School of Medicine of Lyons, read a paper entitled "Memoir on the presence of arsenic in the Hydrochloric Acid of commerce, and consequently, in the same acid purified for the use of pharmaceutists and chemical laboratories." The author sums up his results as follows :

- 1st. That some commercial muriatic acid is found to contain arsenic.
- 2d. That such acid, purified by the process ordinarily employed in laboratories, furnishes a hydrochloric acid equally arseniferous.
- 3d. That the amount of arsenic contained in such acid is quite appreciable. A kilogramme of muriatic acid, purified by distillation, gave an amount of sulphuret equal to gr. 0.722, almost a gramme of arsenious acid.
- 4th. The arsenic contained in this acid is derived from sulphuric acid used in the manufacture, which being obtained from pyrites, contains arsenic.
- 5th. Experiment has proved that the arsenic does not exist in the state of arsenious acid, but as a chloride, which accounts for its great volatility, and its presence in the distilled acid.
- 6th. Arsenious acid, then, is converted into chloride and water by the action of hydrochloric acid, which offers an explanation of the action of this hydracid upon arsenious acid less soluble in pure water.
- 7th. The use of an arseniferous hydrochloric acid may occasion serious inconvenience, in chemical research, and in the arts.
- 8th. This arseniferous acid may also give rise to serious danger, if employed as a remedy, or an ingredient of compounds.
- 9th. The use of this acid is particularly dangerous in medico-legal examinations, when hydro-sulphuric acid is employed upon a liquid supposed to contain arsenic, since an arsenical precipitate will be found, although none of this poison be contained in the suspected liquid.

M. Dupasquier recommends the following mode of rendering the acid pure :—mix equal quantities of the acid and water; subject the mixture to a current of hydro-sulphuric acid ; separate the sulphuret which results, first uniting it by shaking it together. Acid thus diluted may be filtered through paper. It is perfectly colourless, and gives no spot with Marsh's apparatus. It is true that this mode weakens the acid somewhat, but this may be avoided in some measure, by using less water, or by redistilling and collecting the gas in less water.

Robiquet, some time since, had communicated to the *Journal de Chimie Medicale*, that hydrochloric acid might contain arsenic; which he attributed either to the sulphuric acid, or the cast-iron cylinders in which the chloride of sodium is decomposed.—*Jour. Chimie. Med.*

At the same sitting, MM. Forbes and Gelis communicated that in using Marsh's apparatus, several specimens of purified zinc, and containing not

the least sulphur, they have remarked repeatedly, the production of appreciable quantities of hydro-sulphuric acid ; this can only be attributed, say they, to the partial reduction of the sulphuric acid, by the nascent hydrogen.

This is regarded, by the reporters, as an interesting fact, since it shows that when hydro-sulphuric acid is generated in an acid liquid, containing arsenious acid, a mutual action should ensue, giving rise to the formation of sulphuret of arsenic, the presence of which would not be revealed by Marsh's method, as the gentlemen have assured themselves—hence in cases where the quantity of arsenic is small, it may either escape his notice altogether, or else be so feebly indicated as to fail in establishing conviction.—*Ibid.*

Urinary Calculi composed of Cholosterine.—In a letter addressed to the editor of the *Journal de Chimie Medicale*, M. Batilliat renews the assertion which he had previously made, that he had met with urinary calculi composed of cholosterine, and the accuracy of which assertion had been questioned by M. Pelletan. It appears that on the occasion of this fact being reported for the first time, M. Pelletan questioned the possibility of the concretion being other than of biliary origin. In reply, M. Batilliat says that it is the duty of the chemist to be satisfied with determining the composition of concretions which are submitted to him for examination, and to allow to physiologists the explanation of their origin and formation. He then renews the statement in the following words:—"It is not the less certain, that the calculi of which I spoke are derived from the urine, and are composed of cholosterine, as M. Pelletan is himself well assured."

This is a case sufficiently remarkable to be ranked among urinary concretions.—*Ibid.*

Crystals of Sulphur in the compound tincture of Cochlearia.—The presence of sulphur in the plants of the natural family Crucifera, cannot, at the present day, be called in doubt, as every one knows that it is a constituent of the volatile oil of these plants. I do not know, however, that any one since Baumé, has announced the detection of crystals of sulphur in a preparation obtained from the plants by distillation. We have lately collected a small quantity from the compound tincture of cochlearia, prepared July, 1840, and which was exposed to cold, the last winter. To satisfy ourselves that the crystals were really sulphur, we projected them on burning coals, and perceived them to burn with a blue flame, and to give off the characteristic odour of sulphurous acid.—*Ibid.*

On the Distilled Water of Bitter Almonds. By JACOB BELL.—The subject was introduced by an allusion to the use of this remedy as an external application, by several medical men, among whom were mentioned the

names of Dr. Hodgkin, Mr. May, of Tottenham, and the late Dr. Sims, Physician to the Marylebone Infirmary.

The following is a quotation from a communication with which Dr. Hodgkin had favored the author:—

“The principal use to which I have applied the Bitter Almond Water has been as a means of allaying distressing itching, whether *prurigo senilis*, or the local varieties of the affection in which the itching is almost intolerable. In some of these cases, and especially in *prurigo ani*, I have found it singularly useful. In employing it pretty extensively I have observed that whilst in some cases I obtained an immediate and gratifying effect, in some others it appeared to produce no benefit, but caused smarting and irritation. From this I was induced to believe that it affects different skins differently, as is the case with oil of turpentine, in consequence of peculiarities in individual sensibility. I have sometimes prescribed the Water of Bitter Almonds, diluted with distilled water, but never met with any inconvenience following the use of the former undiluted, except the smarting above mentioned.”

“An efficient substitute may be obtained extemporaneously by having recourse to the essential oil.

“The strength of wash employed by Edward May is a drop to the ounce, which is prepared by adding a solution of the oil in spirit to water. He keeps this solution of a known strength, one part of the oil to seven of the spirit answers the purpose very well. He uses the same preparation as a substitute for hydrocyanic acid for internal administration; gives about half a drop for a dose, and finds that it has the advantage of being palatable as well as efficacious.”

Mr. Bell then proceeded to consider the constitution of the oil of bitter almonds, with a view to determine the nature of its properties as a medicinal agent.

The oil of bitter almonds, of which the water is a saturated solution, has been minutely analysed by Robiquet, Pelouze, and other French chemists, and a paper on the subject, written by MM. Wohler and Liebig, is to be found in the *Annales de Chimie et Physique*, Vol. LI. The oil which comes over in distillation is a compound of a peculiar essential oil with hydrocyanic acid. The acid may be separated by adding liquor potassæ and protochloride of iron and re-distilling. The oil which is thus obtained is colorless, and has a specific gravity of 1.043. By exposure to the atmosphere or to oxygen, it is converted into benzoic acid; which process depends on a change in the elements. The oil is a compound of benzole and hydrogen, one equivalent of each. It is, therefore, a hyduret of benzole, while benzoic acid is a compound of benzole and oxygen, or an oxide of benzole.

M. Liebig thus explains the decomposition:—

“When oil of bitter almonds is exposed to the air, it absorbs two equiv-

alents of oxygen, and is converted into benzoic acid; but half the oxygen absorbed combines with the hydrogen of the oil and forms water, which remains in union with the anhydrous benzoic acid."*

Neither this oil nor the hydrocyanic acid pre-exist in the almond, but are developed by the action of the water, during distillation.

Mr. Bell then made the following allusion to hydrocyanic acid in the state in which it is usually employed in medicine.

The powerful effects of hydrocyanic acid, and the danger which is likely to result from inaccuracy in the dose, render uniformity in its strength of the highest importance, whilst its volatility and liability to decomposition occasion considerable difficulty in attaining this object.

Every time the stopper is removed from a bottle containing it, a portion of the real acid escapes, and although the quantity which is liberated at each time may be unappreciable, it is clear that when a bottle, containing an ounce or two, is nearly emptied in the usual routine of dispensing, the remaining portion must be considerably reduced in strength. This may serve to explain a circumstance which has occasionally excited the surprise of medical men, that after having daily increased the dose, with careful attention to the effects up to a certain point, a very slight accession, or even a repetition of the last dose, has been known to produce violent and alarming symptoms. It has, in several instances, been discovered on investigation, that the last mixture was prepared from a fresh bottle of acid, which had not lost strength by exposure, while the former acid, by becoming gradually weaker, had misled the practitioner in estimating its effects. The extreme difficulty of guarding against this inconvenience, especially where the demand is not sufficient to ensure a rapid consumption, is a subject of much importance. Dr. A. T. Thomson has proposed that hydrocyanic acid should be kept in four or six ounce bottles diluted with water in the proportion of a drop or two to the ounce, by which means a fresh bottle would be opened for almost every prescription. This plan might answer the purpose when water is the vehicle ordered, but when this is not the case we have no alternative but to keep the acid of the medical strength, and to dispense it from a very small bottle.

The hydrocyanic acid of Scheele contains five per cent., by weight, of real acid; that of the pharmacopeia is about two-fifths of the above strength. This fact unfortunately is not generally known in the profession, and Scheele's acid having been a long time taken as the standard, is habitually prescribed by many practitioners. When the word "Scheele" is not inserted in the prescription, and the acid of the Pharmacopœia is employed, the patient receives only two-fifths of the dose intended, and the reputation of the dispenser is injured by the inefficacy of the medicine.

*"Organic Chemistry, in its application to Agriculture and Physiology," by Jus-tus Liebig, M. D. &c.

Several instances might be mentioned in which chemists have thus undeservedly been accused of using "hydrocyanic acid which was good for nothing."

As many practitioners almost entirely avoid prescribing hydrocyanic acid, on account of the difficulty of preserving it of a uniform strength, and as others are in the habit of using the oil of bitter almonds as a substitute, the comparative merits of the two remedies claim our attention ; we, therefore, look to the medical profession for information on this point.

Pharmaceutical Transactions, of Sep. 1, 1841.

